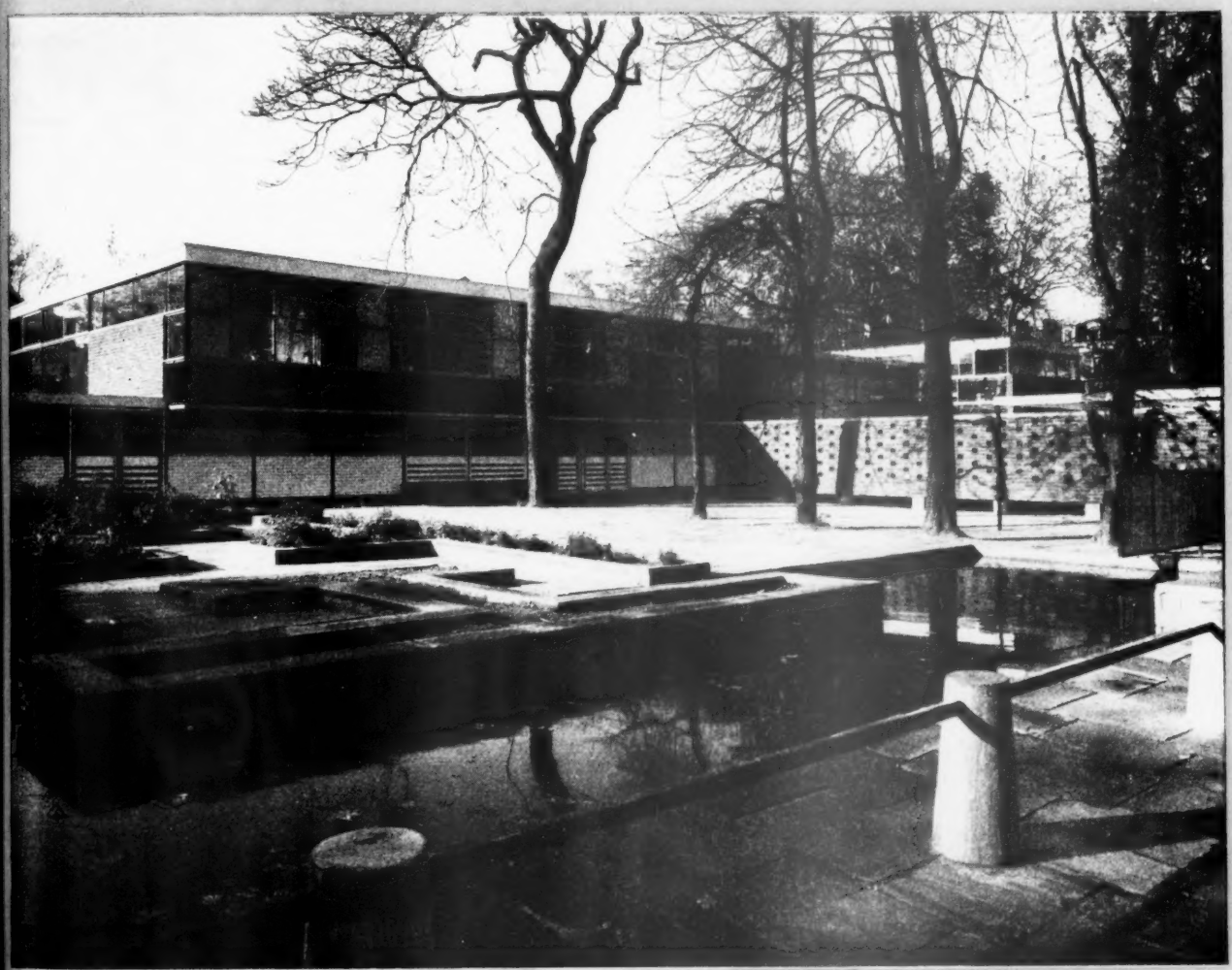
THIRD SERIES VOL 64 NUMBER 8 JUNE 1957

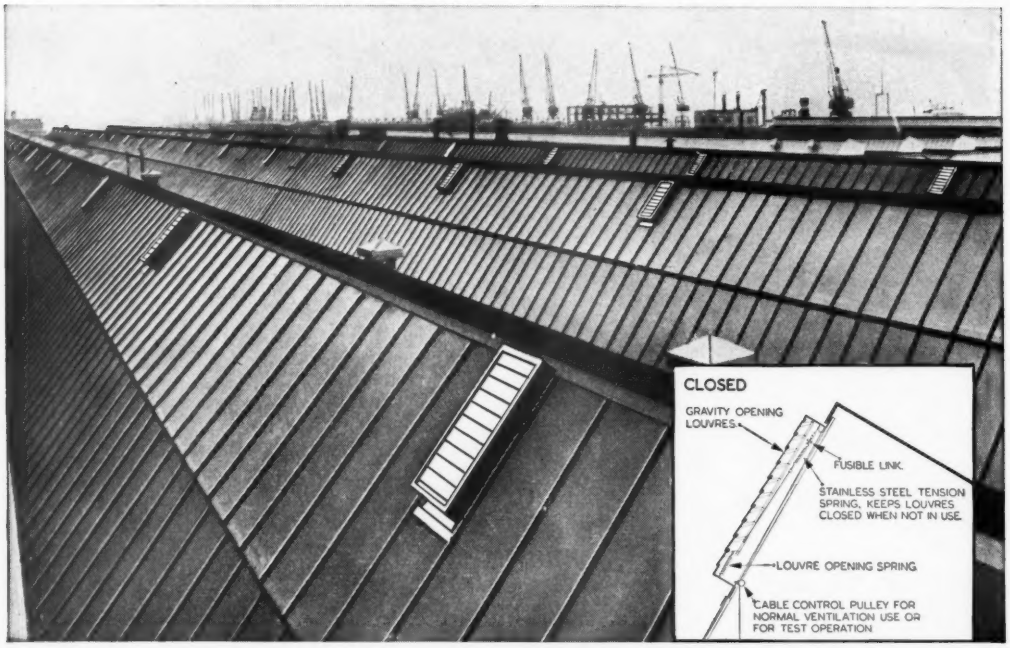
THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

66 PORTLAND PLACE LONDON W1 · TWO SHILLINGS AND SIXPENCE



Bousfield Primary School, South Bolton Gardens, London, S.W.10. Architects: Chamberlin, Powell and Bon

VENTILATION *AND* FIRE PROTECTION!



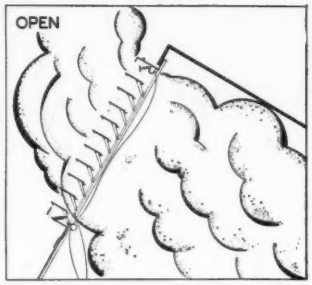
with the COLT DUAL PURPOSE FIRE VENTILATOR

at AC-Delco, Division of GENERAL MOTORS LTD., Southampton.

A study of industrial fires in Britain and America has shown that the primary cause for the spread of fire is super-heated air, smoke and explosive gases trapped under the roof. Building up in heat and intensity, they cause flash fires and smoke rapidly extends downwards, filling the premises and preventing the fire fighters' work.

To solve this, Colt have designed the Dual Purpose Fire Ventilator which, normally, *provides ventilation and—in the event of fire—functions as a heat and smoke exhaust.*

Standard practice in America, these installations are rapidly being adopted in Britain. Already, 1,290 Colt Dual Purpose Fire Ventilators have been installed for General Motors in this country.



The insets illustrate the action of the ventilator as a Heat and Smoke Exhaust. In the event of fire, the fusible link fuses, providing Automatic Escape for Super-Heated Air and Smoke.

Write to Dept. AF.9/6 for paper "Some Aspects of Fire Prevention in Industrial Buildings" by M. J. Reaney, which deals fully with this matter.

COLT VENTILATION

COLT VENTILATION LTD SURBITON · SURREY

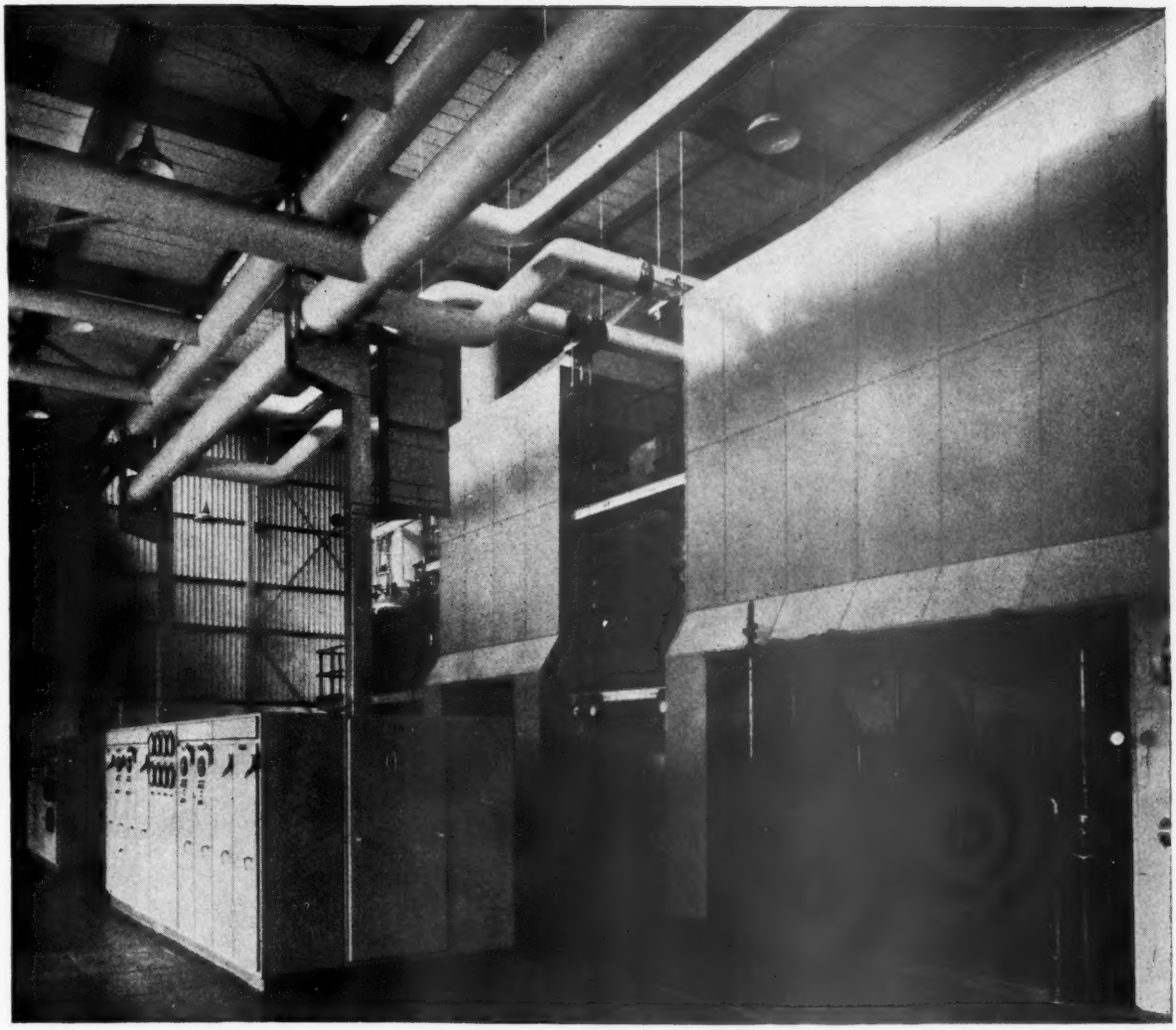
TELEPHONE: ELMBRIDGE 6511 (10 lines)

U.S.A. Subsidiary: Colt Ventilation of America Inc., Los Angeles.

Branches at: Birmingham, Bradford, Bridgend (Glam.), Bristol, Coventry, Dublin, Edinburgh, Glasgow, Liverpool, London, Manchester, Newcastle-upon-Tyne, Sheffield and Warwick.

Agents in: Australia, Belgian Congo, Canada, Cyprus, India, Indonesia, Madagascar, Malaya, Mauritius, New Zealand, Pakistan, Portugal, North and South Rhodesia, and South Africa.

G.579D



Architects : Thomas Mitchell & Partners, A.R.I.B.A.

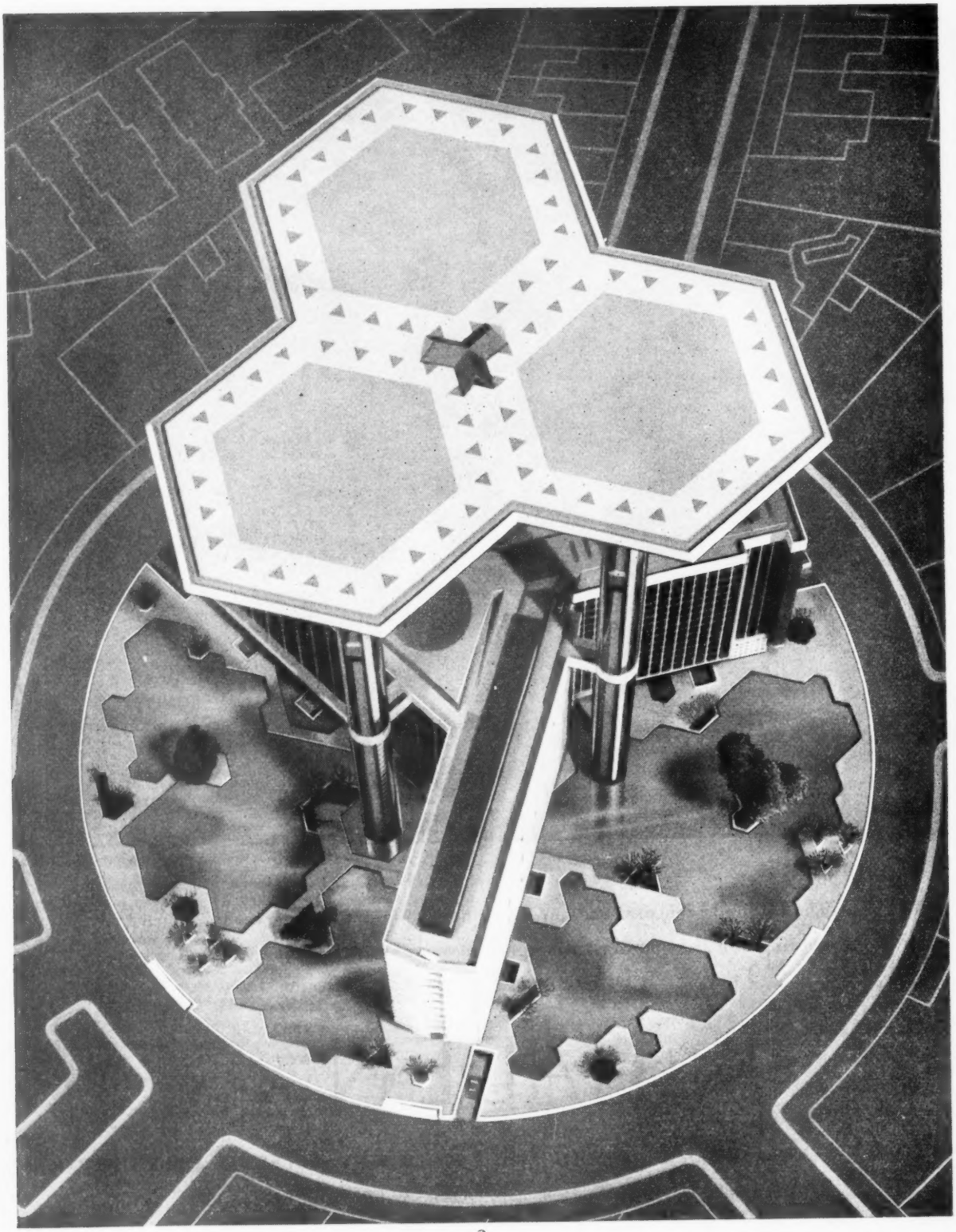
The oil fired high pressure hot water boiler plant which serves the space heating and the manufacturing process requirements of the Commer Cars Factory at Dunstable was designed and installed by

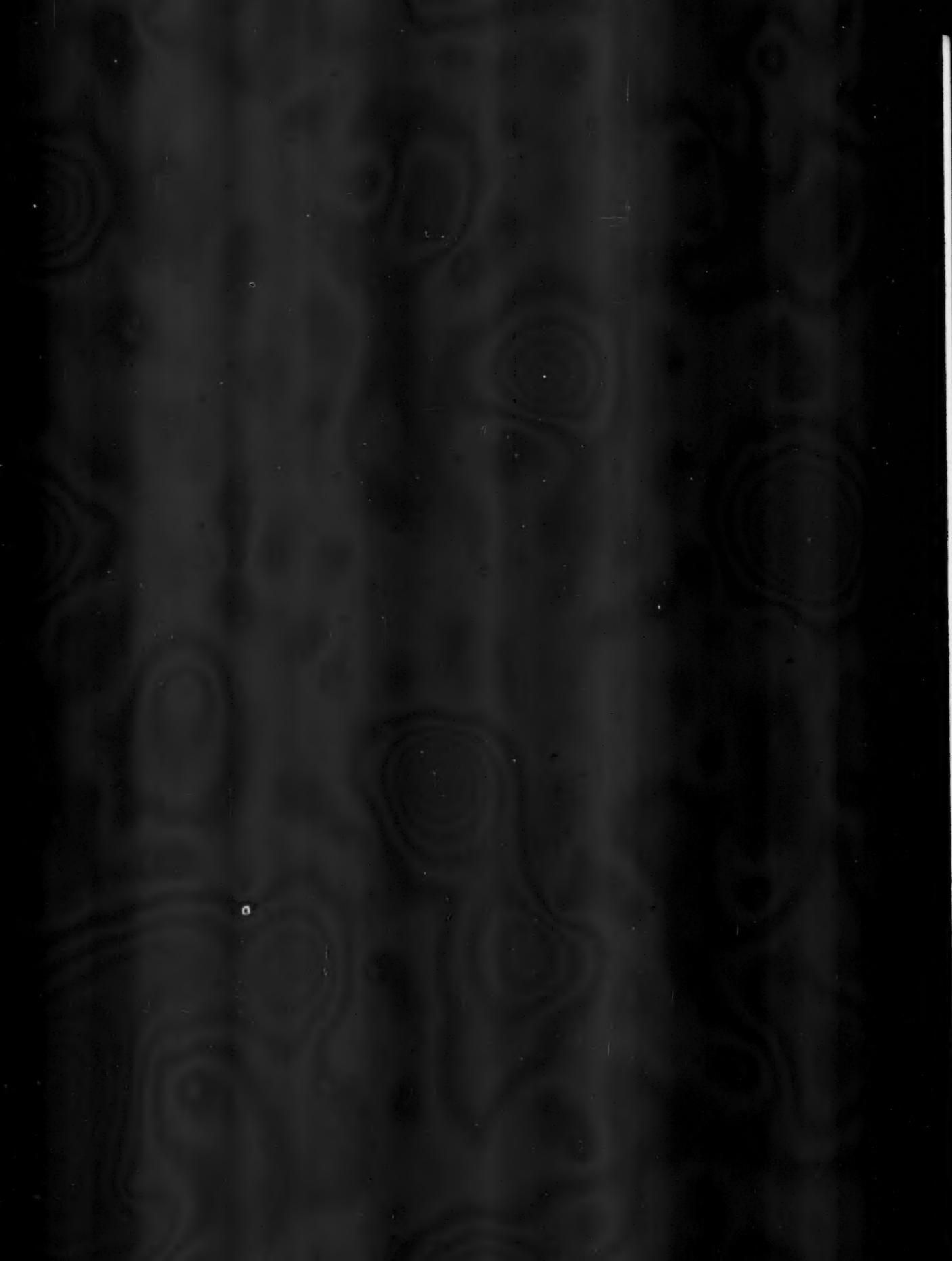
G.N. HADEN & SONS LTD

HEATING · VENTILATING · AIR CONDITIONING · PLUMBING · INDUSTRIAL PROCESS SERVICES

Head Office : 7-12 Tavistock Square, London, W.C.1 EUSton 1288

and Branches throughout the Provinces





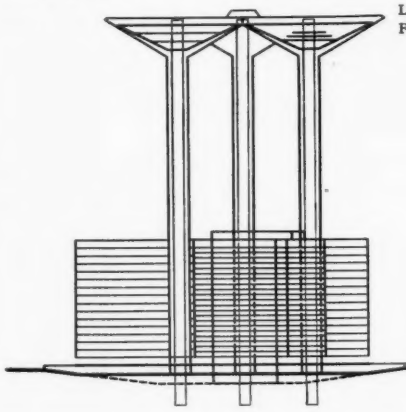
SKYPORT ONE

THE FLIGHT DECK

SKYPORT ONE is a *Glass Age Development Committee project. It has been designed by James Dartford, A.R.I.B.A., as an example of the city-centre air station which will be needed in the year 2000. These drawings describe a purely imaginary building which would occupy a site at St. George's Circus, London, but they are also intended as basic plans for a standard type of Skyport, which, with local variations — especially in regard to height — would serve any large centre of population. In essence SKYPORT ONE consists of a 500 ft. high landing-deck supported by three shafts which, in this example, straddle a 200 ft. high triple-wing building.

TURNAROUND AND AIR MOVEMENT

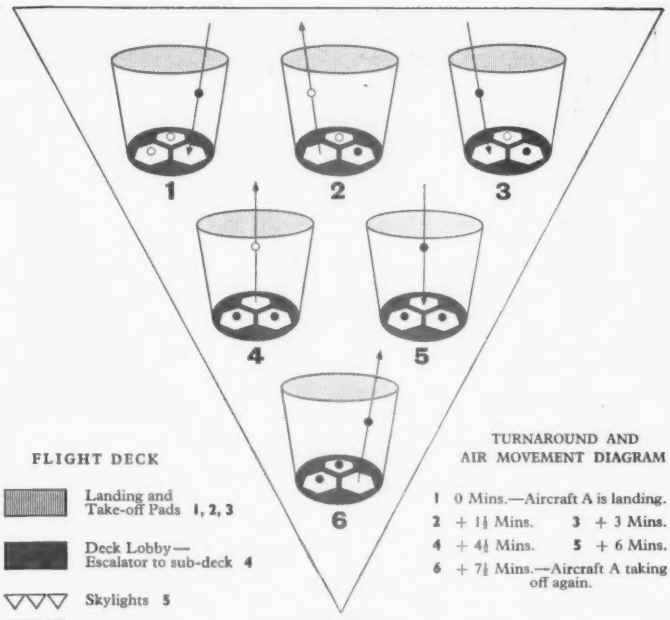
The landing deck has been designed as a *triple-turnaround* air stop. It forms the floor of a 500 ft. high approach 'cone' to which aircraft are directed by automatically-operated homing beacons, descent being guided by electronic landing beams located under each of the three pads. Vertical ascent or descent through the cone takes approximately one minute with a safety interval of 30 seconds during which there is no aircraft movement inside the cone. This timing permits each aircraft remaining on deck 7½ minutes before taking off again. Assuming the aircraft carry 30 passengers, this schedule means that SKYPORT ONE can handle a peak traffic of 720 passengers per hour. Daily totals might well be something between 7,000 and 10,000.



The size of the landing and take-off pads is approximately 120 ft. diameter. The deck is formed of a tetrahedronal space structure to redistribute impact loads and has a non-skid, non-reflecting surface. Air and Skyport Control rooms are located immediately under the deck, skylights being provided where required. Escalators carry passengers to the flight deck from reception centres at the top of the lift shafts. Special screens, telescopically housed in the superstructure, protect passengers against rain and high wind.

The design of the superstructure, framed in steel or light alloy, lends itself to the use of helicopters in erection. Clusters of deck units would be lifted into the sky and lowered into position above previously formed platforms.

** The Glass Age Development Committee is convened by Pilkington Brothers Limited and consists of G. A. Jellicoe, F.R.I.B.A., Edward Mills, F.R.I.B.A., and Ove Arup and Partners.*



FLIGHT DECK

Landing and Take-off Pads 1, 2, 3

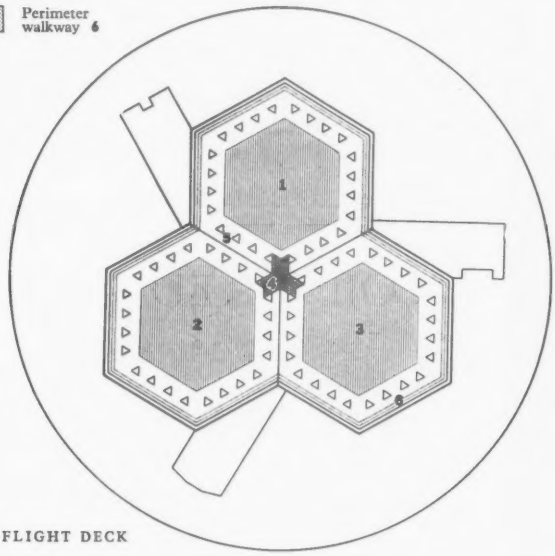
Deck Lobby — Escalator to sub-deck 4

Skylights 5

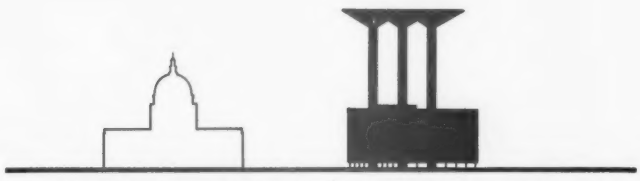
Perimeter walkway 6

TURNAROUND AND AIR MOVEMENT DIAGRAM

1 0 Mins.—Aircraft A is landing.
2 + 1½ Mins. 3 + 3 Mins.
4 + 4½ Mins. 5 + 6 Mins.
6 + 7½ Mins.—Aircraft A taking off again.



FLIGHT DECK

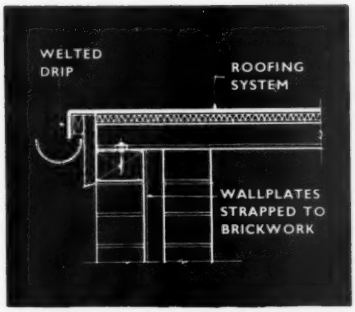


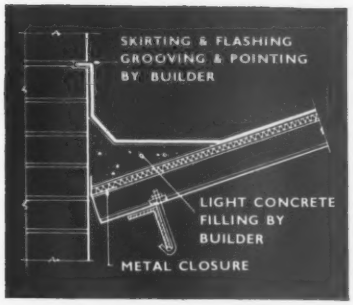
COMPARATIVE HEIGHTS OF ST. PAUL'S CATHEDRAL AND SKYPORT

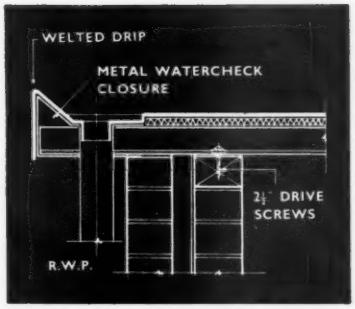
ISSUED BY PILKINGTON BROTHERS LIMITED
ST. HELENS, LANCASHIRE

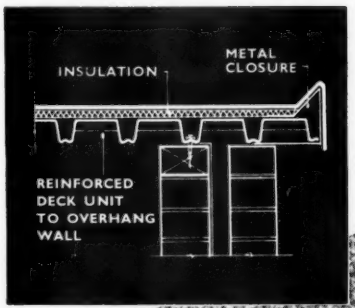
TYPICAL DETAILS OF FINISH

eaves and verge details









ANDERSON *aluminium*

'E' *decking*

'E' Decking is a complete roof incorporating aluminium deck units, insulation and weatherproofing by an Anderson system of built-up roofing. The roof is lightweight combined with maximum strength for all purposes, has good insulation value, high reflectivity and is adaptable to most roofs. Full technical details of the system are available on request.

D. ANDERSON & SON LTD

STRETFORD
MANCHESTER
Telephone: LONgford 1113

OLD FORD
LONDON, E.3
Telephone: AMHerst 2388

The gamut is the palette of the Composer, so to speak. Invert the metaphor and you might describe the palette as the keyboard of the colourist.

Colour Complex

For the composition and execution of effective colour schemes, a really broad and comprehensive colour "gamut" is essential.

The new Duresco Architect's Colour Range of 138 shades, incorporating the '101' range, is a flexible instrument of great compass, of rich and subtle tones.

DURESCO PRODUCTS *The Inventors of Water Paint*

For full details of this new range and the superb paints it represents, please write or telephone to:—

The Technical Advisory Service, DURESCO PRODUCTS LTD.,

London: Charlton, S.E.7., GRE 0034/5/6. Manchester: 65 Great Ducie St., DEA 3161

...and private offices

"ARMOURPLATE" and "ARMOURCAST" are registered trade marks of Pilkington Brothers Limited. Supplies are available through the usual trade channels.

PILKINGTON'S

"ARMOURCAST" Interior Glass Doors

POLICE FLATS · ORCHARD MEAD HOUSE · CHILDS HILL · LONDON N.W.11

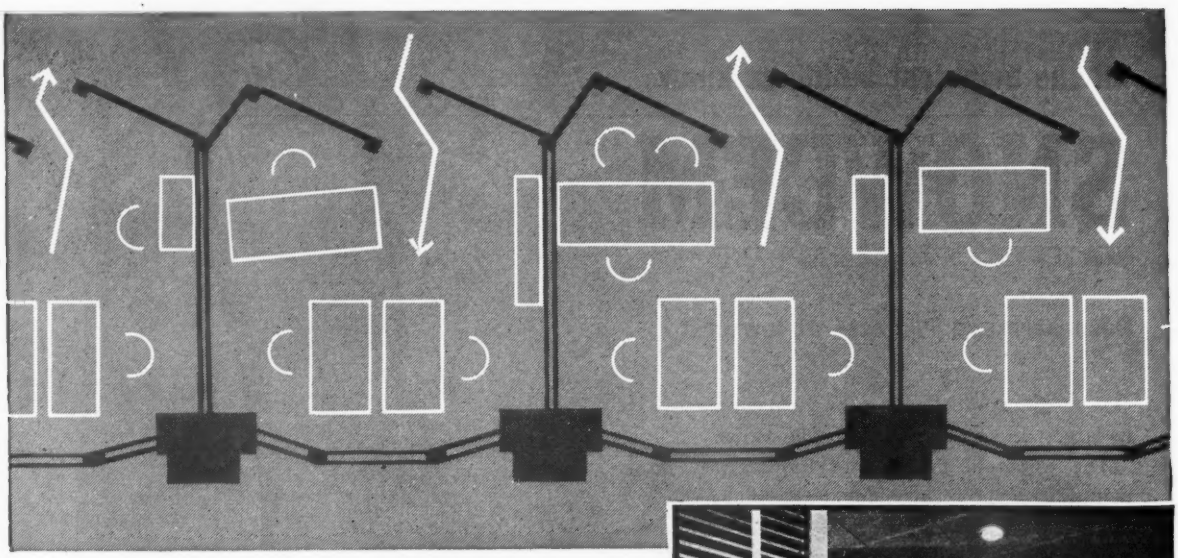
Used in the construction of these flats were: 43,000 'Phorpres' Common Bricks
160,000 'Phorpres' Saxon Facing Bricks 36,000 'Phorpres' Tuscan Facing Bricks

Architect: J. Innes Elliott, B.Arch., A.R.I.B.A.
Chief Architect & Surveyor, Office of the Receiver for the Metropolitan Police District, New Scotland Yard, London S.W.1
Contractors: Tersons Limited, Dollis Park, Finchley, London N.3

PHORPRES

LONDON BRICK COMPANY LIMITED
Head Office: Africa House, Kingsway, London W.C.2. Telephone: HOLborn 8282
Midland District Office: Prudential Buildings, St. Philip's Place, Birmingham 3. Telephone: Central 4141
South-Western District Office: 11 Orchard Street, Bristol 1. Telephone: Bristol 23004/5
Northern District Office: St. Paul's House, 20-22 St. Paul's Street, Leeds. Telephone: Leeds 20771

BY APPOINTMENT TO HER MAJESTY QUEEN ELIZABETH II BRICK MAKERS



The Venetian Blind
Used as a Partition

Modern buildings need a modern interior treatment. A good design can so easily be ruined by labyrinthine inside walls. That is why so many architects nowadays are specifying Luxaflex aluminium venetian blinds for partitioning. Venetian blinds are modern. They can be changed about at will and they do not damage the structure or the flooring. At the same time, they last for years, require no maintenance and precious little cleaning.

Another advantage is that Luxaflex blinds can be left open for partitioning where privacy is not essential. Alternatively, a simple pull gives absolute privacy with completely overlapping slats.

Luxaflex
REGISTERED TRADE-MARK

BRITISH GOOD HOUSEKEEPING INSTITUTE GUARANTEES

venetian blinds

Only Luxaflex offers you:

- *Completely flexible aluminium slats with baked-on diamond-hard paint finish.*
- *Washable, rayon-reinforced plastic tapes. They are colour-fast and will not stretch, shrink or fray*
- *Faultless blind mechanism.*
- *165 colour combinations.*

Please write for Luxaflex Architects' booklet A.6—it will be sent to you free of charge

HUNTER DOUGLAS (GREAT BRITAIN) LTD
162 BROMPTON ROAD, LONDON, S.W.3. ***Telephone KNightsbridge 4488***

A floor a week with

BISON
WIDE SLAB

Wimpey's 8 storey flats, Kirkcaldy
Contractors: George Wimpey & Co. Ltd., Edinburgh

"Bison Wide Slab played an important part in achieving spectacular progress with these 8 storey flats", says Mr. McQueen, Messrs. Wimpey's agent on the site. 3642 sq. yds. of 5" Bison Wide Slab Precast hollow flooring were used.

BISON

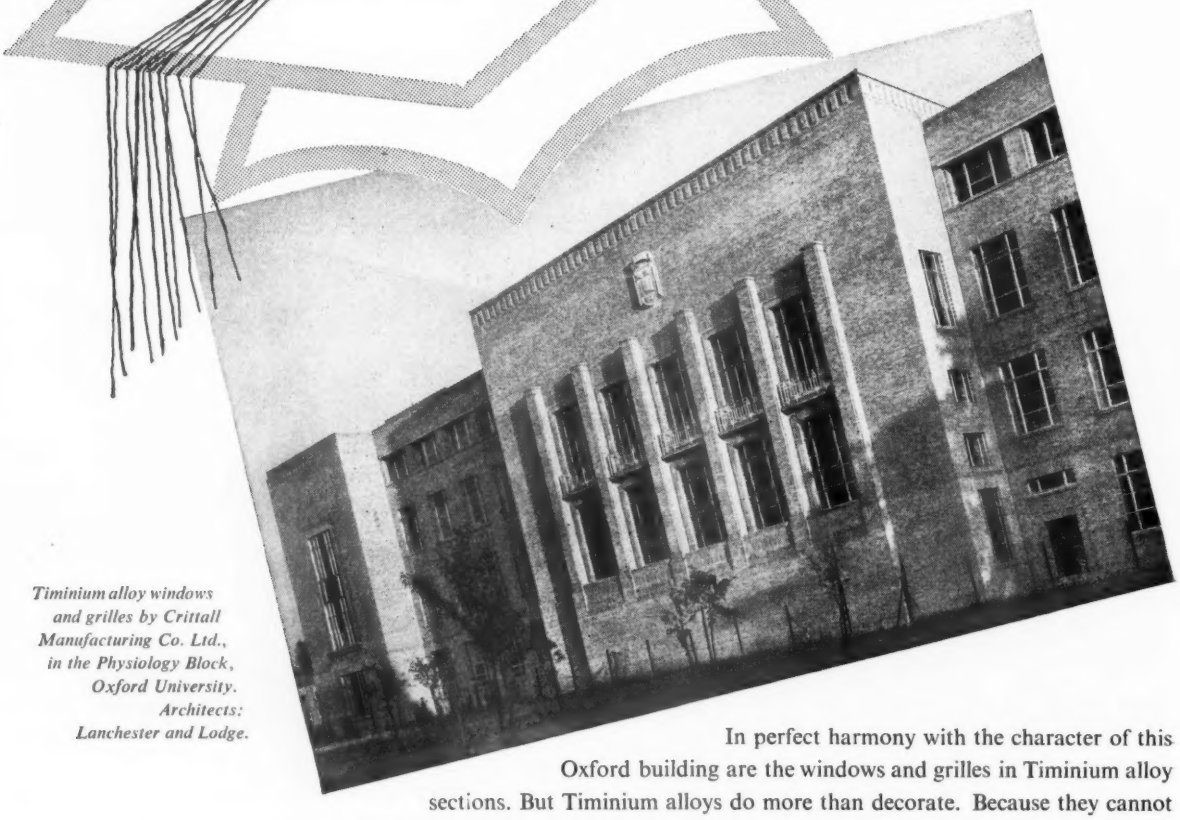
floors, beams and precast frame structures

CONCRETE LIMITED

THE LARGEST STRUCTURAL PRECAST CONCRETE MANUFACTURERS IN THE WORLD
LONDON: Green Lane, Hounslow, Middlesex. *Hounslow 2323*
LEEDS: Stourton, Leeds 10. *Leeds 75421*
LICHFIELD: Dovehouse Fields, Lichfield, Staffs. *Lichfield 3555*
CONCRETE (SCOTLAND) LTD.: Etna Road, Falkirk. *Falkirk 1930*

CON 88

Timinium
right in the front



Timinium alloy windows and grilles by Crittall Manufacturing Co. Ltd., in the Physiology Block, Oxford University. Architects: Lanchester and Lodge.

In perfect harmony with the character of this Oxford building are the windows and grilles in Timinium alloy sections. But Timinium alloys do more than decorate. Because they cannot warp or rust and are so resistant to atmospheric corrosion, they save substantially on upkeep costs: they need no protective painting and next to no maintenance. Their excellent weathering, long life and attractive appearance commend them in an increasing number of applications to progressively-minded architects—and economy-minded clients.

The Development Department of T I Aluminium Ltd., offers an advisory service covering all aspects of aluminium usage. Architects and builders are freely invited to make use of it.

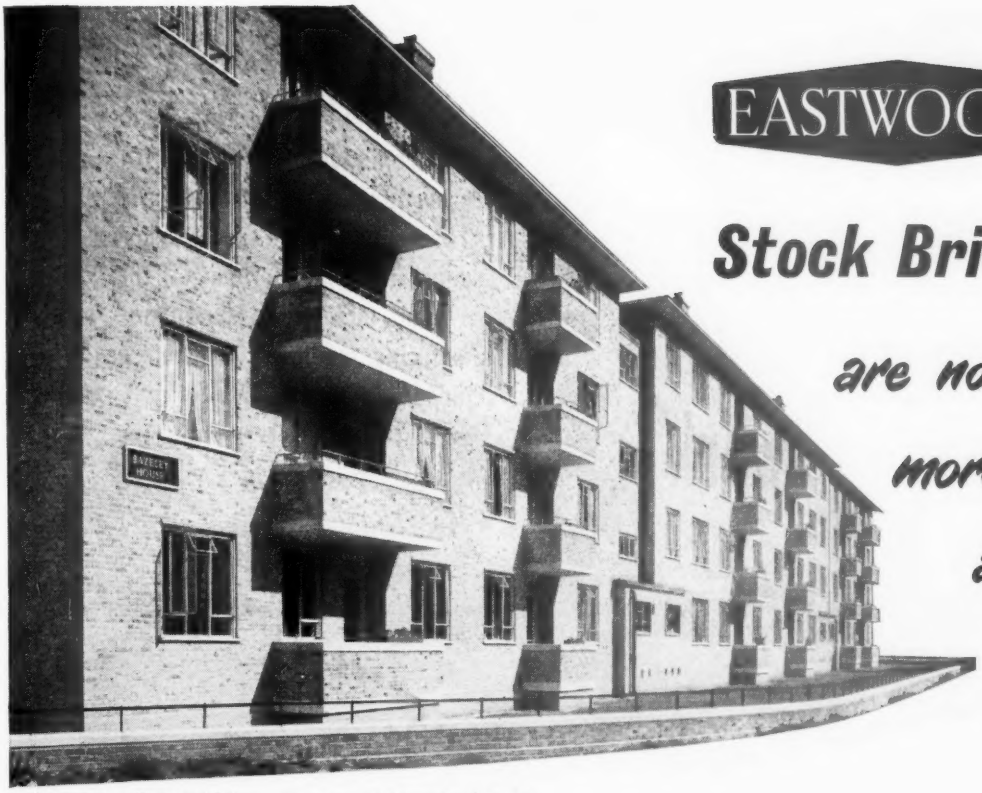
T I Aluminium Ltd

ONE OF THE LARGEST U.K. MANUFACTURERS OF SHEET, CORRUGATED SHEET, STRIP, CIRCLES, PLATE, EXTRUDED SECTIONS AND TUBES IN THE TIMINIUM RANGE OF ALUMINIUM AND ALUMINIUM ALLOYS.

Head Office: Redfern Road, Tyseley, Birmingham 11. Tel. Acocks Green 4211

A TI COMPANY

Offices in: LONDON · BIRMINGHAM · MANCHESTER · LEEDS · GLASGOW · BRISTOL · BELFAST AND DUBLIN

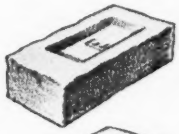


EASTWOODS

Stock Bricks

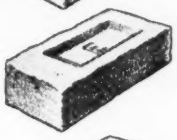
are now more freely available

Architect: Victor Wilkins, F.R.I.B.A. *Contractor: H. Fairweather & Co. Ltd.*



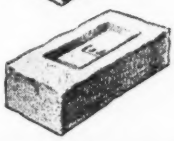
YELLOW FACINGS

A hard high grade stock facing of uniform deep yellow colour and regular shape.
Their mellow warm colour make these bricks very suitable for special architectural features.



SECOND HARD STOCKS

An economical, reliable and well burned brick of varying colour and slight irregularity in shape, the well-known "London" Stock is in great demand for both facing and foundation work.



MILD STOCK FACINGS

Ideally suited for use as facings for schools, factories and housing schemes, Mild Stocks are fairly hard bricks with faces of good medium yellow colour. They are of regular shape, fast in colour and strengthen with age.

Prompt Delivery from Works to Your Site

EASTWOODS SALES LIMITED

Technical and Sales enquiries welcomed at:—Eastwood House, 158-160 City Road, London, E.C.1. Tel: CLErkenwell 2040
or 29 St. Sepulchre Gate, DONCASTER. Tel: Doncaster 49256

Or at any of our depots.
CAMBRIDGE, 117 East Road. Tel. Cambridge 2087; **COVENTRY**, Sandy Lane. Tel. Coventry 61707; **DONCASTER**, Crompton Road. Tel. Doncaster 61442; **EASTLEIGH**, Allbrook, Eastleigh, Hants. Tel. Eastleigh 2621/2; **GILLINGHAM**, (Kent), Trafalgar Street. Tel. Gillingham 59071; **GREENWICH**, Norman Road, S.E.10. Tel. GREenwich 1172; **HILLINGDON**, Uxbridge Road. Tel. Uxbridge 6421/2; **IPSWICH**, Cumberland Street. Tel. Ipswich 3794; **ISLEWORTH**, 11 The Square. Tel. HOUnslow 1181; **KINGSLAND**, 4 Orsman Road, N.1. Tel. SHOreditch 4133/4; **KINGS LYNN**, South Everard Street. Tel. Kings Lynn 3718; **LETCHWORTH**, Birds Hill. Tel. Letchworth 1700; **MORTLAKE**, High Street, S.W.14. Tel. PROspect 7231; **NORWICH**, The Nest, Rosary Road. Tel. Norwich 21498; **SOUTHEND-ON-SEA**, Fairfax Drive, Southend, Essex. Tel. Southend 48171; **SUDBURY**, (Suffolk), North Street, Tel. Sudbury 2416; **WEMBLEY**, St, John's Road. Tel. WEMbley 0126; **WEYBRIDGE**, Bridge Wharf. Tel. Weybridge 3963.

EA8284

The new Finch factory for constructional work

Higher standards of service. Improved quality. Speedier deliveries. These are what we expect to give you with the addition of this 4-span factory to our manufacturing facilities. We believe modern construction work demands modern service—and this is what we intend to provide.

FACTS AND FIGURES

The main structure of the factory, including the crane columns, is in welded-tubular construction. Length 240′, height to eaves 16′. Spans 1 and 2 fitted with 3-ton overhead electric travelling crane. Spans 3 and 4 with 10 cwt. electric monorails. Each span 34′ 0″. Each end fitted with electrically operated roller shutters 15′ 0″ × 14′ 0″. Each roof slope and long side fitted with continuous Patent Glazing.

. . . and these are manufactures produced here.

STANDARD AND SPECIAL TUBULAR STRUCTURES.

TRADITIONAL STEEL STRUCTURES, INCLUDING CONVEYORS, STEEL STAIRCASES AND STEEL DOORS.

BALUSTRADES, RAILINGS, GATES, GRILLES, LIGHT IRONWORK,

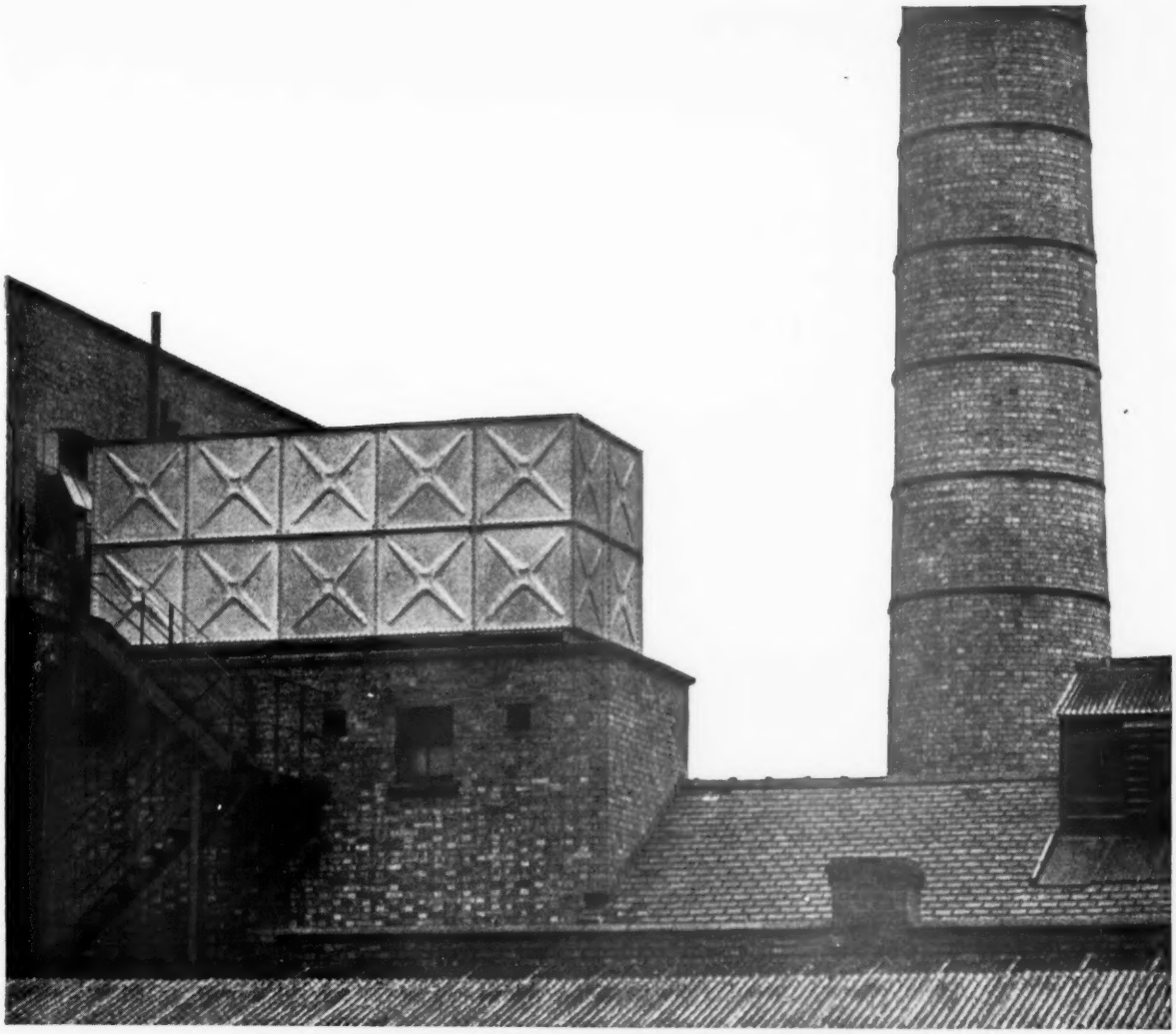
FUEL AND DUST HOPPERS, DUCTS, STEEL LADDERS. CLOAKROOM EQUIPMENT, CATERING EQUIPMENT, DUCTING, SHEET METAL-WORK.

THE Finch ORGANIZATION

B. FINCH & COMPANY LTD

Head Office & Works: Belvedere Works, Barkingside, Essex. *Valentine 8888 (30 lines)*

Showrooms: Finch Corner, 679/687 Eastern Avenue, (Southend Rd.), Ilford

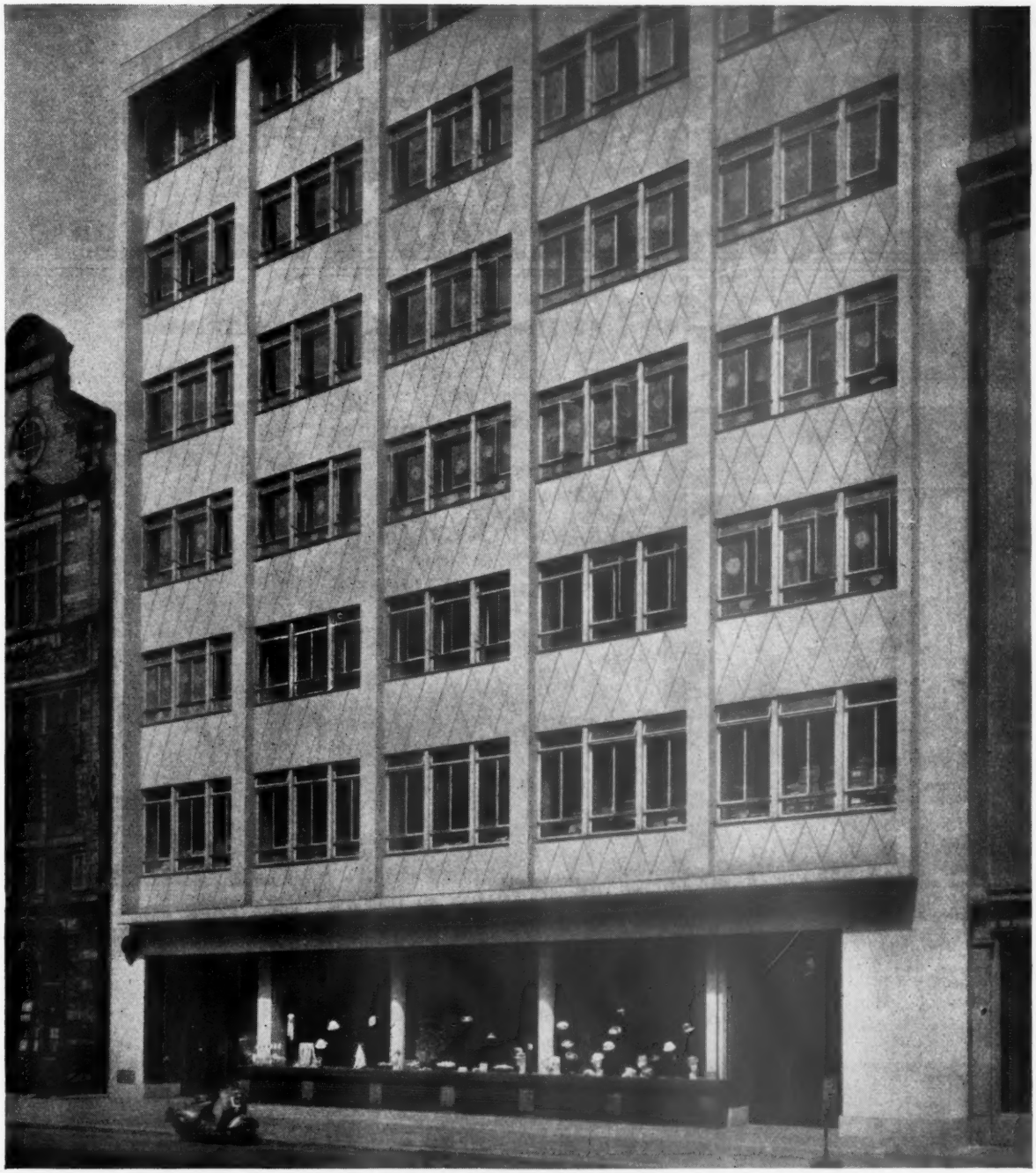


FULL PRODUCTIVITY in many industries is often dependent on the immediate availability of water and other liquids. Braithwaite Pressed Steel Sectional Tanks are suitable for the maintenance of adequate liquid reserves for most industrial needs, and are available in an unlimited range of capacities.

BRAITHWAITE & CO.
ENGINEERS LIMITED

Bridge and Constructional Engineers

LONDON OFFICE: DORLAND HOUSE · REGENT STREET · LONDON SW1 · TELEPHONE: WHITEHALL 3993

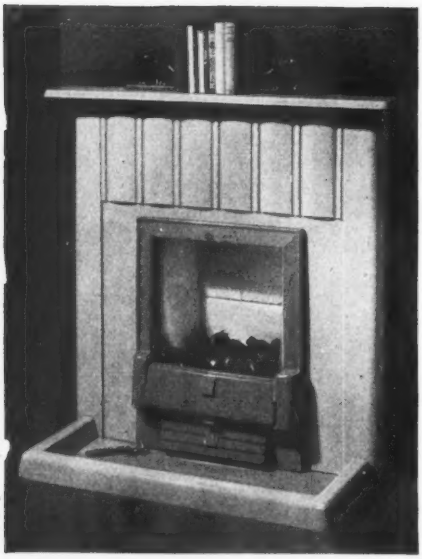


15/17 Great Marlborough Street, London W.1. Architects: Stone, Toms & Partners, F.R.I.B.A.

'URE' CB3/54
Trade Mark

Back-to-Back Grates

On Ministry List of Recommended Appliances



In the LIVING ROOM a continuous burning Open Fire with Back Boiler

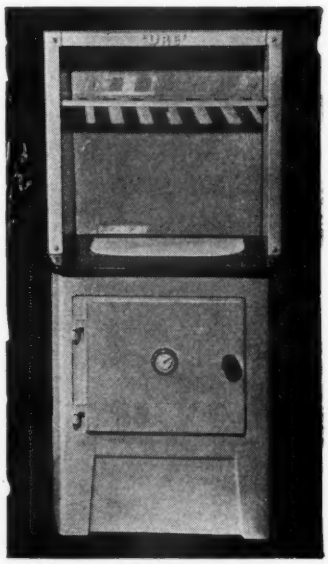
Specify 'URE' and heat 2 rooms with 1 fire

plus ★ COOKING

★ BOILING

★ HOT WATER

The **'URE'** has an Open Fire in the Living Room and a Cooker back-to-back with it in the Kitchen. It heats Living Room and Kitchen. It cooks and provides all hot water requirements. It has a large oven and a rapid boiling hotplate. The fire burns overnight unattended. And all this on about a hundredweight and three-quarters of fuel a week.



In the warm KITCHEN . . . a vitreous enamelled Cooker and rapid Boiling Hotplate

'URE' Grates ensure warm kitchens . . . Living Rooms free from cooking.

Trade Mark

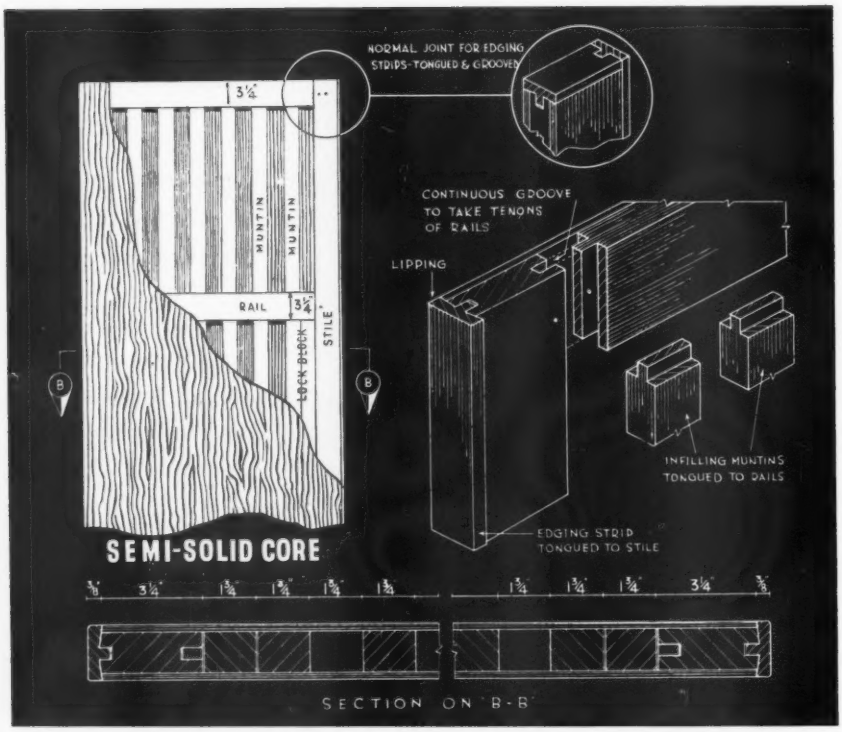
Allan Ure Limited

Pioneers and largest producers of Back-to-Back Grates

Keppochhill Glasgow N

Telephone: Douglas 2641 *Telegrams: "Baktobak"*

ROYAL FLUSH DOORS



NOTE: "ROYAL FLUSH" Solid Core Doors have the infilling muntins placed edge to edge. The Cores are of Western Red Cedar.

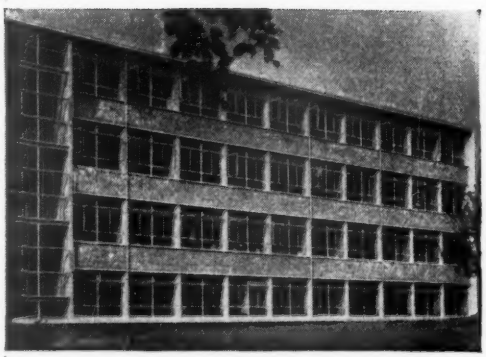
A Semi-Solid Core door was used in this illustration, but if Solid Core doors are required, the spaces in the Semi-Solid door are filled in with muntins.

NORTH GLOUCESTERSHIRE TECHNICAL COLLEGE, CHELTENHAM. NEW BUILDINGS, PHASE II.

S. E. Urwin Esq., F.R.I.B.A. County Architect Gloucester County Council, Shirehall, Gloucester.

General Contractor: Messrs. A. C. Billings & Sons Ltd., 54 Winchcombe Street, Cheltenham, Gloucester.

Please write for details of the "Royal Flush" Ronuk Decoration Service.



SOUTHERNS LIMITED

BOLD SAW MILLS, WIDNES, LANCS.

Branches at Manchester, Dudley, London, Glasgow, Hanley, Bristol and Kettering

℗ 49

people are beginning to expect warmth and comfort – peace and quiet with

FIBREGLASS

FIBREGLASS LIMITED, ST. HELENS, LANCS · ST. HELENS 4224

Designed by the Regional Architect, Cardiff, Chief Architect's Division, Ministry of Works
Contractors: Messrs. Gee, Walker & Slater, Ltd

The Crown Building at Haverfordwest, an example of the use of the John Williams Curtain Walling System, which shows that the main planning grid of 3ft. 4in. centres horizontal and 8 in. increments vertically is a sound basis for economical design.

aluminium and galvanized steel

CURTAIN WALLING

Write today for illustrated brochure

JOHN WILLIAMS & SONS (CARDIFF) LTD

EAST MOORS ROAD, CARDIFF

Established 1844

Telephone: Cardiff 33622 · Telegrams: Metals, Cardiff

London Office: Bank Chambers, Finsbury Park, N.4

Telephone: ARChway 1622 · *Telegrams:* 'Dissolving' London

JW

WINDOW MAKERS SINCE 1889

Bartrev is on the beam

Builders are all in Harmony with Bartrev—an essential building material

At last there is harmony among Builders and Architects. They all agree that Bartrev has a place in every building being built today. Its low cost, the fact that it doesn't cut to waste and its tested strength and durability make it the first choice for ceilings, floors, walls, partitions and doors.

Bartrev, the chipboard supplied in any length, is available in the following thicknesses—$\frac{1}{4}$", $\frac{3}{8}$", $\frac{1}{2}$", $\frac{5}{8}$" and $\frac{3}{4}$". For further information write to one of the Registered Distributors, any of whom can supply Bartrev to any part of the country, or to Vere Engineering Co. Ltd., 3 Vere Street, London, W.1.

Registered Distributors

The Merchant Trading Co. Ltd., London.
Wm. Evans & Co. (Distributors) Ltd., Liverpool.
The Metal Agencies Co. Ltd., Bristol.
Montague L. Meyer Ltd., London.
L. P. Thomas Co. Ltd., Glasgow.
H. T. Tennison & Co. Ltd., Hull.
The British Door Marketing Co. Ltd., Burton-on-Trent.
C. V. Creffield & Co. Ltd., West Drayton.
Jewson & Sons Ltd., Norwich.
Travis & Arnold Ltd., Northampton.

BARTREV

Good delivery *is one of the aspects of our service upon which we particularly pride ourselves. Putting it simply we deliver at the right time; not too early so that the site becomes unnecessarily cluttered; not too late so that dependent work falls behind schedule. Whether your flooring problem is one of critical delivery dates, whether you need advice of a more technical nature, put Siegwart first*

SIEGWART

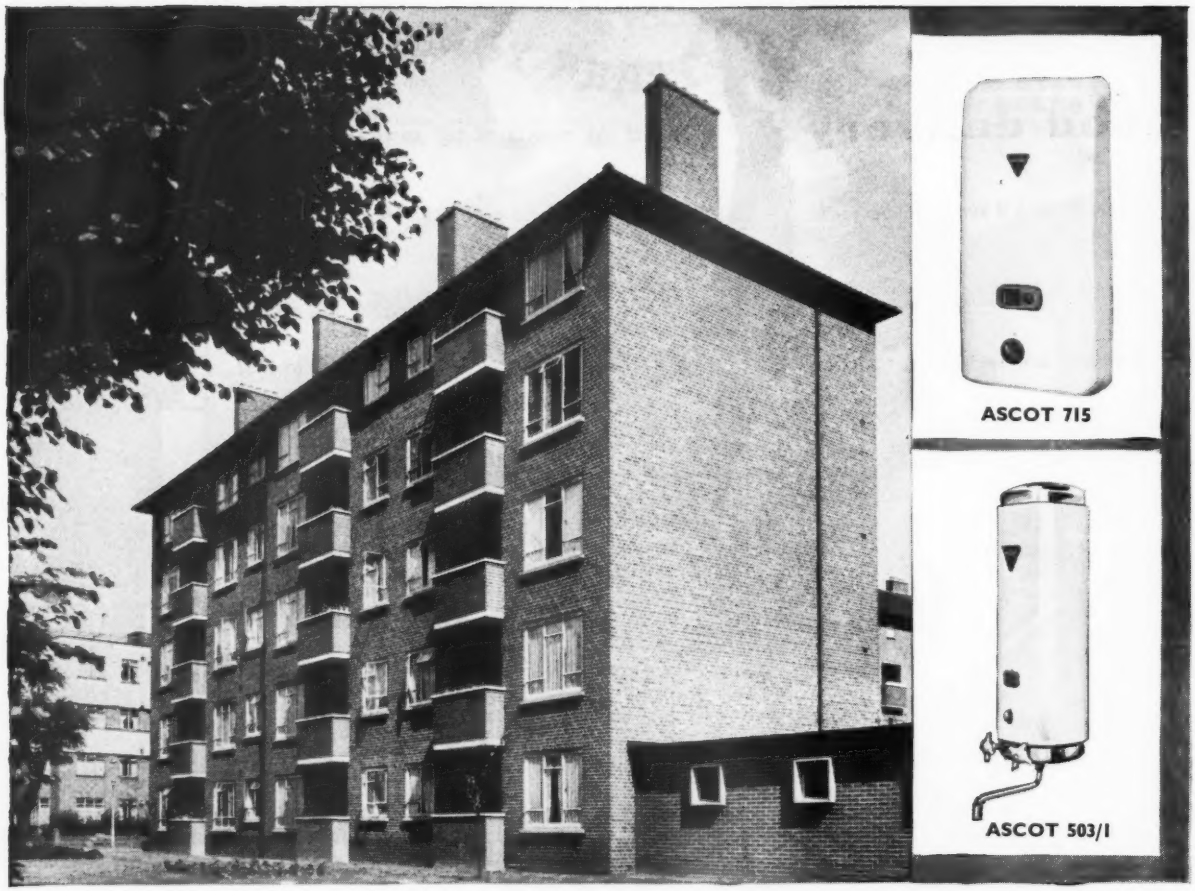
PRECAST

FLOORS

AND

ROOFS

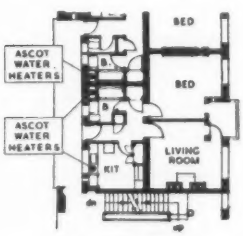
Siegwart Floor Company Limited
Gable House, Rickmansworth,
Herts.
Telephone: Rickmansworth 2268
Branch Offices at
Birmingham, Manchester and
Glasgow.
Works at Croxley Green,
Enderby near Leicester,
and Paisley.



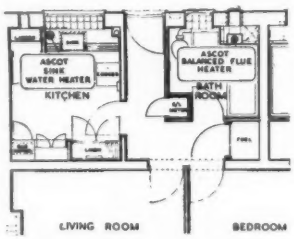
ASCOT IN NEW HOUSING (2)

The Metropolitan Borough of Hackney's new Keir Hardie Estate comprises 49 flats and maisonettes grouped in three five-storey blocks on the east side of Upper Clapton Road. Hot water for all these dwellings, which range from three-bedroom maisonettes to bed-sitting-room flats, is supplied by Ascot Instantaneous Gas Water Heaters.

An Ascot 715 "Balanced Flue" Multipoint installed in every bathroom provides hot water for bath, washbasin and, in the case of the smaller dwellings, for the kitchen sink. Ascot 503 sink water heaters are installed in the kitchens of the larger dwellings where long pipe-runs from the 715's would otherwise be necessary.



Plan of complete single-bedroom flat.



Kitchen and Bathroom of single-bedroom flat.

RESPONSIBLE AUTHORITIES

G. L. A. Downing, O.B.E., M.Inst. C.E.,
(Borough Engineer & Surveyor)

R. H. Harrison, A.R.I.B.A.
(Chief Assistant Architect)

J. H. Elmer, A.R.I.B.A.
(Assistant Architect)

V. W. Allen
(Chief Building Surveyor)

REGD. TRADE MARK
ASCOT

ASCOT GAS WATER HEATERS LTD · 255 NORTH CIRCULAR ROAD · LONDON · NW10

WHG/A267

A member of the PARNALL Group of Companies

THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

66 PORTLAND PLACE LONDON W1

Telephone: LANGHAM 5721–7
Telegrams: RIBAZO WESDO LONDON

JUNE 1957 THIRD SERIES VOL. 64 NUMBER 8 TWO SHILLINGS AND SIXPENCE

EDITORIAL

Welcome Home

On 5 June the President and Secretary R.I.B.A. arrived back in London by air. The tour is over, but the Diary which records it is still a long way behind events. The second instalment appears on page 313.

Architects acting as House Agents

Some publicity has been given to a recent decision on appeal to the High Court in the case of Hughes v. the A.R.C.U.K. The appellant had been practising as an architect, surveyor, estate agent and valuer prior to the passing of the Registration Acts. It was held by the Court that it was not within the power of the A.R.C.U.K. to strike the appellant's name off the Register for disgraceful conduct.

The grounds for the disciplinary action by the A.R.C.U.K. were that the appellant should have ceased an activity which became forbidden after due notice, although he had been carrying out this activity before the passing of the Acts.

The Court held that a subsequent prohibition by the A.R.C.U.K. could not remove from him a right to do something which he had done before the introduction of the Registration Acts and which had not disqualified him from having his name included on the Register.

Members should be quite clear as to the implications of this decision. It does not alter in any way the position of a member of the Royal Institute in relation to the R.I.B.A. Code of Professional Conduct.

British Architects' Conference

The Conference papers on 'Finance, Design and Durability of Buildings' will be printed in full in the July JOURNAL. The proceedings at the Conference will be reported in the August issue.

The Conference Ball will be held on 12 July at Blenheim Palace, Woodstock, by kind permission of His Grace the Duke of Marlborough. Arrangements have been made for the Ball to be open to non-members of the Conference. Members of allied professions and the building industry will be very welcome. Tickets, price two guineas each, which will include supper, may be obtained from the Secretary, R.I.B.A., or from Mrs. M. J. Holmes, 9 Blackhall Road, Oxford (Telephone: Oxford 57288). Places in motor-coaches to the Ball and afterwards back to Oxford may be reserved at 3*s*. each, payable in advance.

Sir Ian MacAlister

The news of the death on 10 June of Sir Ian MacAlister reaches the JOURNAL as it goes to press. We offer our deepest sympathy to Lady MacAlister.

A memorial service for Sir Ian will be held at All Souls, Langham Place, at 11.30 on 28 June.

Voysey Centenary

Charles Annesley Voysey was born on 28 May 1857. He was awarded the Royal Gold Medal in 1940.

To commemorate his Centenary the Architectural Association held a small exhibition of his designs, and the President of the A.A., Mr. J. Brandon-Jones [*A*], writing in the A.A. JOURNAL for May, gave a most interesting and sympathetic account of Voysey's character and career, including a definitive bibliography and chronological index such as one would wish for for every British architect worthy of record.

Another exhibition for connoisseurs was the Exhibition of British Architectural Draughtsmanship at the Building Centre which closed on 8 June.

The Younger Members of the Building Team

Following a recommendation from the Joint Advisory Committee on Training, the Joint Consultative Committee of Architects, Quantity Surveyors and Builders is taking steps to encourage, throughout the country, the holding of joint meetings, discussions, debates, etc., by the younger qualified members of the building team.

An informal liaison committee has been set up consisting of the Chairmen and Hon. Secretaries of the R.I.C.S. Junior Organisation (Quantity Surveyors' Committee) and the Institute of Builders Licentiate Discussion Club, with representatives of the R.I.B.A. Mr. David Waterhouse [*A*], has been elected Chairman and Mr. R. C. Greaves, A.R.I.C.S., Hon. Secretary. The liaison committee's terms of reference are:

(*a*) to establish liaison between the three bodies at 'junior level'; and

(*b*) to proceed informally to further the holding of joint meetings, commencing in the London area.

Arrangements are in hand for the latter part of the current session and for the early part of the Session 1957–58.

Council Business

At the Council Meeting held on 7 May, Mr. Leonard C. Howitt, Vice-President in the Chair, it was reported that the Jury entrusted with the award of the R.I.B.A. London Architecture Bronze Medal for the year ending 31 December 1956 had made the award in favour of the Bousfield Primary School, South Bolton Gardens, S.W.10, designed by Messrs. Chamberlin, Powell and Bon (Peter H. G. Chamberlin [*A*], Geoffry C. H. Powell [*A*] and Christof Bon).

Formal approval was given to the following awards of R.I.B.A. Architecture Bronze Medals by the Juries appointed by the respective Allied Societies:—

The Manchester Society of Architects, for the five-year period ending 31 December 1955: Renold House, Wythenshawe, Manchester, designed by Messrs. Cruickshank and Seward (H. T. Seward [*F*]).

The South Eastern Society of Architects, for the three-year period ending 31 December 1956: Messrs. David Greig's shop, St. George's Street, Canterbury, designed by Messrs. R. W. Paine and Partners (R. W. Paine [*A*], C. W. H. Wright [*A*], P. Brown [*A*] and M. R. Crux [*A*]).

The South Wales Institute of Architects, for the nine-year period ending 31 December 1955: Sports Pavilion for the University College of South Wales and Monmouthshire, Llanrumney, Cardiff, designed by Messrs. T. Alwyn Lloyd and Gordon (Dr. T. Alwyn Lloyd [*F*] and A. J. Gordon [*A*]).

Wessex Federal Society of Architects, for the three-year period ending 31 December 1956: Walcot House, Dover House and Laundry, Snow Hill, Bath, designed by Mr. T. W. Snailum [*F*].

Leaving the design aspect of architecture and turning to the legal, it was then reported that the Institute had been invited to give oral evidence before the Lord Chancellor's Committee to review Law on Rights of Light in relation to War Damaged Sites on cases of difficulty in this respect. It was agreed to leave it to the Officers of the Practice Committee to consider the matter.

Any member who can report any case of specific difficulty with Rights of Light in relation to war damaged sites should get in touch with the Secretary, R.I.B.A., at an early date.

The Council considered a report on the design of specialist work prepared by a Sub-Committee following upon points raised at the Harrogate Conference in 1955. It was agreed that this matter required more extensive study, and it was also agreed to convene an ad hoc Committee composed of members of the Practice, Public Relations and Science Committees to review the whole subject.

Other points from the Council Meeting appear on page 342.

R.I.B.A. Travelling Exhibition—Subtopia

A new travelling exhibition has been prepared by the R.I.B.A. dealing with the subject of 'Subtopia'—now much in the news.

The exhibition was shown at the Royal Institute for a short period earlier this month and is now ready for touring. Two copies have been prepared for sending round the country and Allied Societies who wish to show it are invited to get in touch with the R.I.B.A.

These travelling exhibitions are lent free of charge and posters for local display are sent to borrowers together with press information. All Allied Societies, Chapters and Branches are being sent details of the exhibition and the R.I.B.A. will endeavour, as on previous occasions, to arrange the tours so that the distances between centres are as short as possible.

Centenary of the Firm of Charles Smith and Son

The year 1957 is a notable one in the history of Charles Smith and Son [*F*/*A*], Architects and Surveyors, of 164 Friar Street, Reading, as it marks the 100th Anniversary of the founding of the firm by the late Mr. Charles Smith [*F*].

Mr. Smith was born in Hampshire in 1832, and on leaving school came to Reading to serve his articles with Mr. Wm. Ford Poulton, who was the principal architect in the town.

Mr. Smith eventually served for about five years as assistant in several London offices, finally becoming managing assistant to Mr. W. M. Teulon, a gentleman whose name was highly honoured in the world of architecture.

Mr. Smith returned to Reading in 1857 and commenced his own practice.

His first work of note was the development of Whiteknights Park Estate, while in the early years of his practice he also transacted a large amount of important professional work for the second Duke of Wellington on the Strathfieldsaye, Wolverton and Ewhurst estates.

Mr. Smith, who was Mayor of Reading in the years 1874–76, died in 1912 at the age of 79.

In 1893 Mr. Chas. Smith was joined in partnership by his son, Mr. Chas. Steward Smith [*F*], and from that time the firm has practised under the title of Charles Smith and Son.

In November 1908 Mr. Harry Hutt [*F*], who had served as articled pupil with the firm and eventually became managing assistant, was taken into partnership, and this continued until the death of Mr. Chas. Smith in 1912, after which Mr. C. S. Smith and Mr. H. Hutt continued the practice. Mr. C. S. Smith died on 19 August 1923.

After service in the 1914–18 war Mr. Eric Steward Smith, the present senior partner, a grandson of the founder of the firm, entered the office as articled pupil, subsequently continuing his studies at the Architectural Association and qualifying as Associate of the R.I.B.A.; he served in the office of Mr. Michael Waterhouse [*F*] in London for a period, after which in 1927 he joined Mr. Harry Hutt in partnership, and this continued until the death of Mr. Hutt in 1932.

In 1933 Mr. Hutt's son, Mr. H. Morrice Hutt, was taken into partnership by Mr. E. S. Smith, having served with the firm as articled pupil, subsequently studying at the A.A. and qualifying as Associate of the R.I.B.A.

Mr. Chas. Steward Smith was the first Chairman of the Berkshire Society of Architects from 1921 to 1924, and Mr. Harry Hutt was President of the Berks, Bucks and Oxon Architectural Association from 1929–31. Mr. Eric Steward Smith has been President of this Association from 1955 to 1957, and it is interesting to note that this coincides with the centenary of his firm.

During the 100 years of the firm's existence it has carried out a large number of various types of buildings of importance in the southern half of the country.

Mr. Aubert T. Doe [*L*], the present senior assistant, entered the office of the firm in 1896 and has completed 61 years' service, or nearly two-thirds of the 100 years of its history, and this, it is thought, may be a record.

Blenheim Palace: Top Left, The Great Court. Top Right, the Great Hall. Below, the Salon. Blenheim will be floodlit for the Conference Ball, and the State Rooms will be open to Conference members and guests. Dancing will be in the Library. Photographs: Victor Glasstone [*A*]

Symposium: Family Life in High Density Housing

This whole day symposium, held on 24 May, was well attended not only by architects in private practice and those in local authority employ but also by specialists in the fields of housing management, landscape and its maintenance, building maintenance and social welfare.

Mr. Holger Blom, Chief of the Parks Department in Stockholm, came over specially to attend the Conference and his paper and the slides he showed aroused much interest. There were useful discussions both at the morning and afternoon sessions on a number of points raised by the speakers.

A full report of the proceedings is being published and this will be sent to all delegates who attended the Conference. The report will contain the papers by the principal speakers which were circulated to delegates in advance together with full reports of the speeches made by the other speakers and notes on the discussions. As many illustrations as possible will be included in the report which should form a useful record of the views expressed at the symposium.

Additional copies of the report, price 10*s*. (by post 10*s*. 6*d*.) will be available on application to the Secretary, R.I.B.A.

Foreign Students

Requests are received occasionally from foreign architectural societies on behalf of their members and students for the Institute to arrange employment for the latter in architects' offices in the United Kingdom for limited periods to gain experience of English practice. It is hoped to draw up a list of employers in this country who would be prepared to accept foreign qualified architects or foreign architectural students in their offices. Any member who is interested in this project is asked to write to the Secretary, R.I.B.A., with a view to receiving any applications from abroad which would be transmitted through the R.I.B.A. Appointments Department. It is also hoped to make available to such prospective employers information on the conditions of employment of foreign nationals in the United Kingdom.

R.I.B.A. Diary

MONDAY 24 JUNE. 6 p.m. Library Group Annual General Meeting.

WEDNESDAY 10 JULY–SATURDAY 13 JULY inclusive. British Architects' Conference at Oxford.

Blenheim Palace, Woodstock

The Great Court, looking towards the Stable block

Ironwork detail, with the Main Portico in background

The Water Garden. The landscaping was designed by 'Capability' Brown. Photographs by Victor Glasstone [*A*].

Architecture in Berks, Bucks and Oxon

Some buildings which have been erected during the four-year period ended 31 December 1956, in the area of the Allied Society who are this year's hosts at the British Architects' Conference.

Architectural Review

Wycombe High School, High Wycombe, Bucks. East elevation, assembly hall block. Architect: Denis Clarke Hall [*F*]

Castles Estate Infants' School, Bletchley, Bucks. Playground entrance and assembly hall. F. B. Pooley [*F*], County Architect, Buckinghamshire

Western Development, King's End, Bicester, Oxon. Architect: Lesslie K. Watson [*F*]

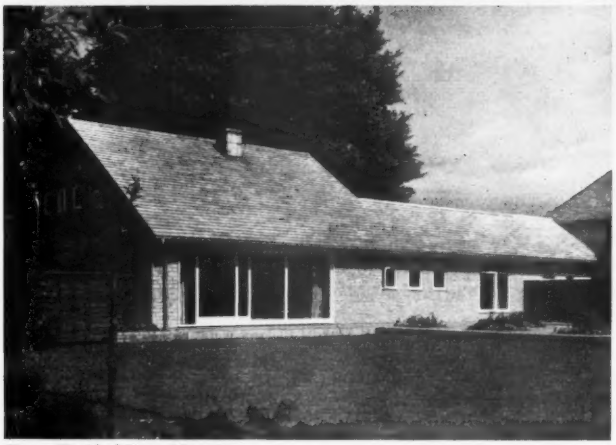
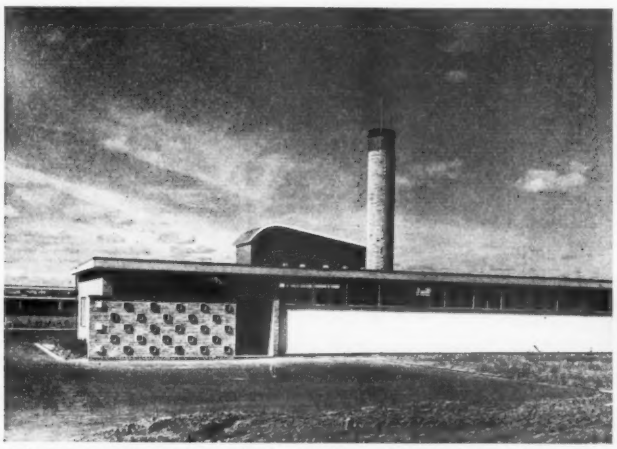
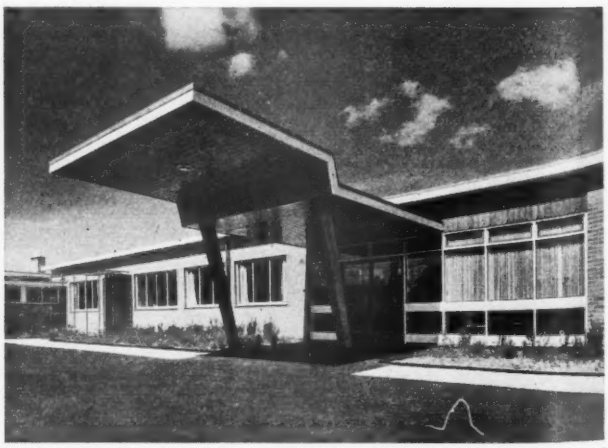


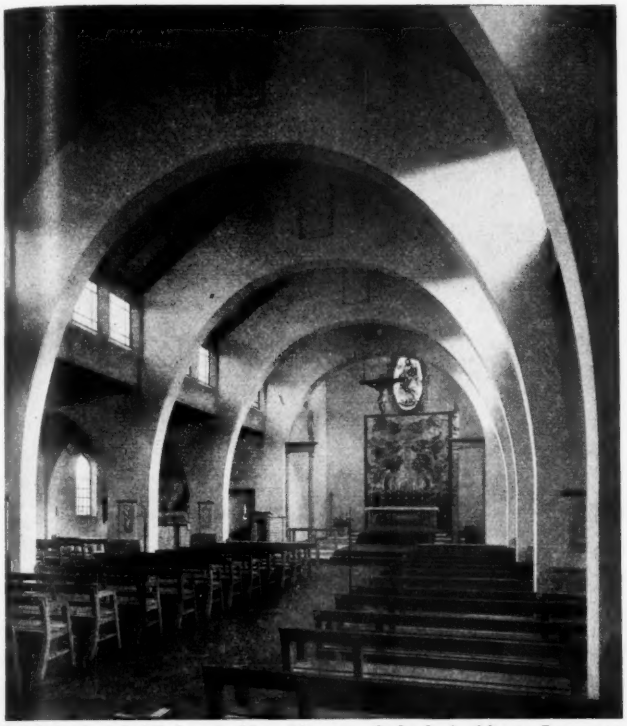
Photo: The Ideal Home Magazine

Two houses at Witney, Oxon. Architect: Gerald Banks [*A*]



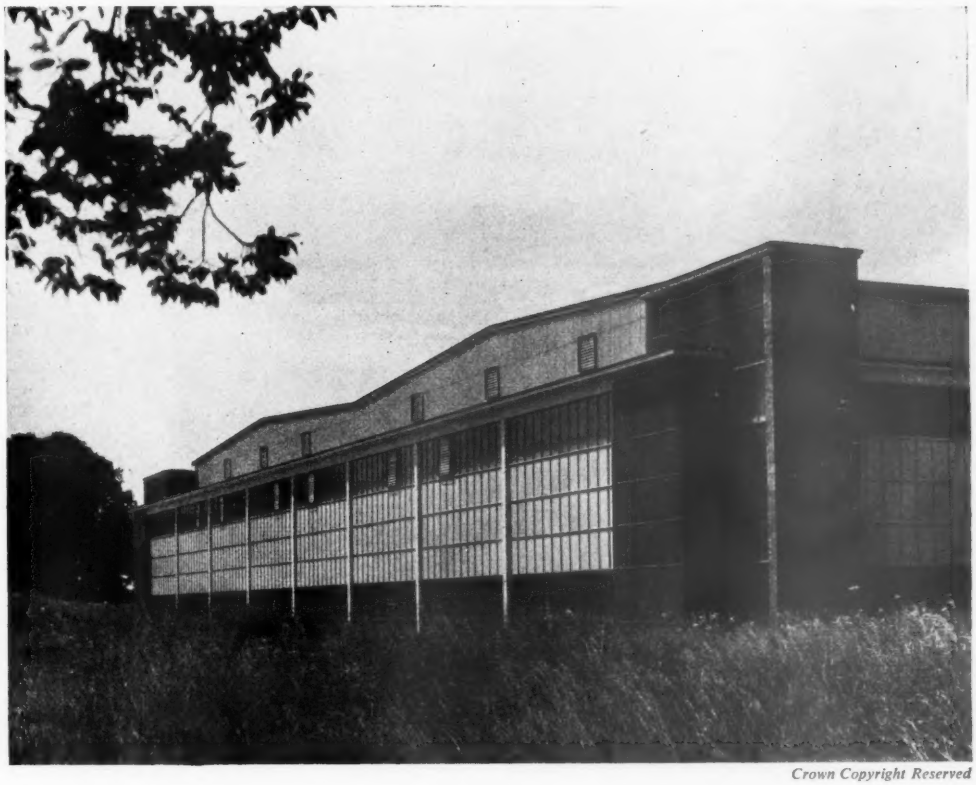


Admission Unit, Ashhurst Clinic, Littlemore Hospital, Oxford. L.: The boiler house. R.: Ambulance canopy. Architects: R. Fielding Dodd and Stevens [*FF*]



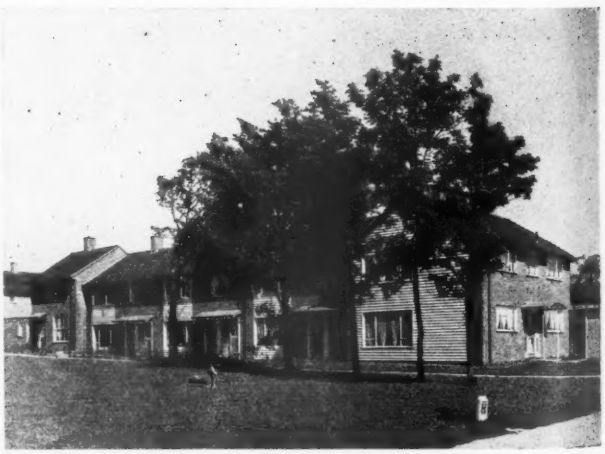
St. Michael and All Angels, New Marston, Oxford. Architect: Lawrence Dale [*F*]

Beaconsfield Branch Library. F. B. Pooley [*F*], County Architect, Buckinghamshire



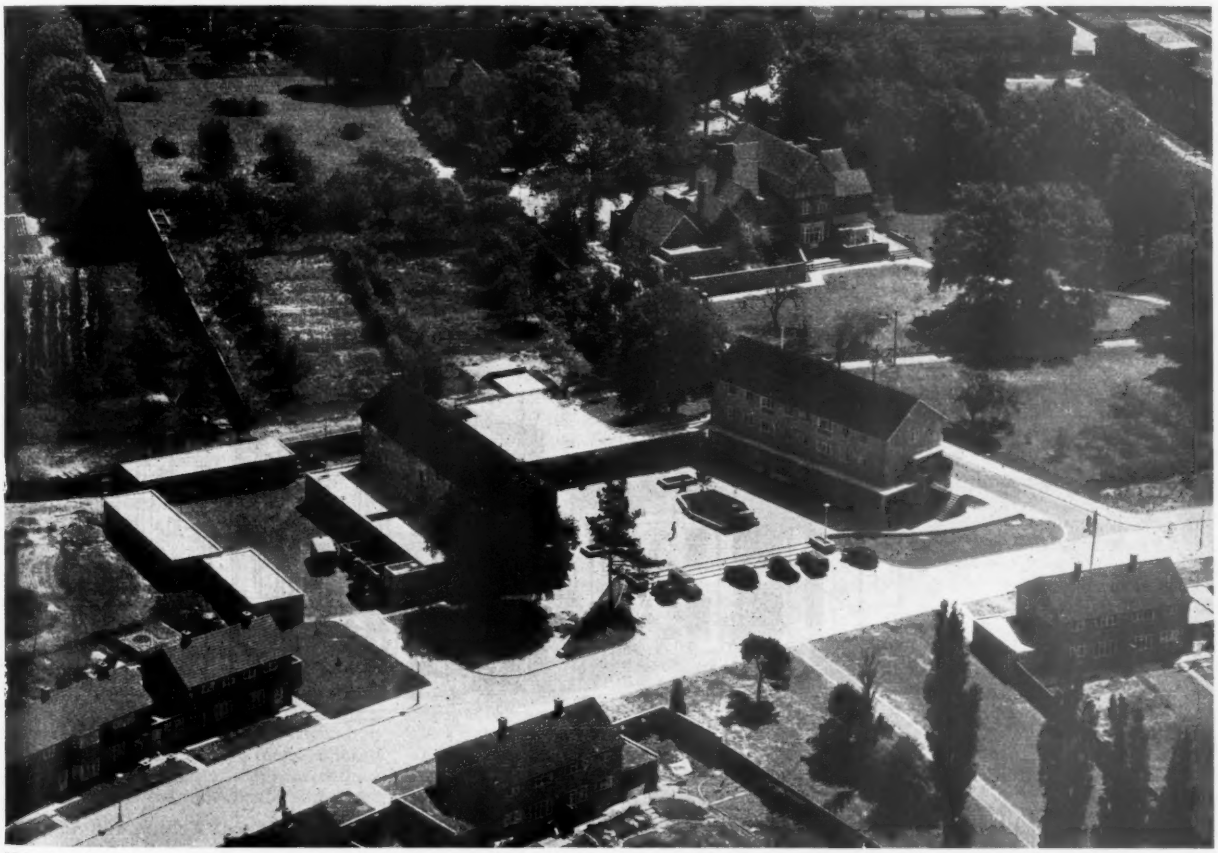
D.S.I.R. Hydraulics Research Station, Wallingford, Berks.
Chief Architect's Division of the Ministry of Works.
Superintending Architect: H. A. Snow [*A*]

Houses, Priestwood Avenue, Bracknell. E. A. Ferriby [*A*], Chief Architect, Bracknell Development Corporation



Houses at Merryhill Road and Horsneile Lane, Bracknell. E. A. Ferriby [*A*], Chief Architect, Bracknell Development Corporation

Wick Hill Secondary Modern School, Bracknell. J. T. Castle [*A*], County Architect, Berkshire



Neighbouring Shopping Centre. Priestwood Square, Bracknell. E. A. Ferriby [*A*], Chief Architect, Bracknell Development Corporation

Oxford Sketches by John C. Haskell, R.S. [*A*]

Top left: View down Lane from High Street looking towards the Radcliffe Camera

Top right: Drawn from the door to Queen's College, with All Saints' in the distance

Above: The Clarendon and Sheldonian from the Broad.

The Case for a Theory of Modern Architecture

By John Summerson, C.B.E., F.B.A. [*A*]

given at the R.I.B.A. on 21 May. Mr. Harold Conolly, C.B.E., Vice-President, in the Chair

EVER SINCE THE MODERN MOVEMENT got on to its feet, questions have been asked about what it stands on. An association of some kind between what is vaguely called 'theory' and what is vaguely called 'modern architecture' continues, I believe, to be a topic frequently debated, and I am told that teachers in some of the schools feel a practical need for some sort of theoretical formula as a means of introducing students to the principles of modern design. Hence this paper, which offers nothing new but is simply an investigation—an attempt to discover whether there does exist any basis of principle applicable to modern architecture, different from the bases applicable to any other architecture or alternatively whether such a basis can be abstracted out of prevailing practice and ideas.

I should like to take this alternative first because it offers an obvious *prima facie* case. I think it is a bad case but it is necessary to put it up in order to put it down. Modern architecture exists to the extent that there are plenty of buildings which everyone in this room would immediately classify as products of the modern movement on the basis of certain recurrent formal arrangements and relationships. Embarrassed as we are by the use of such expressions as 'the modern style', 'manner' or 'idiom' there is positively no denying the consensus of characterisation. Modern architecture is there all right. Furthermore, closely associated with this architecture is a number of ideas—ideas expressing modernity in one sense or another, nearly always either by analogy with the past or by analogy with some other activity than architecture. The architects who design the buildings tend to quote and promote these ideas and it would be very difficult to show that this complex of architecture and ideas is anything short of valid in relation to present-day conditions. There is indeed no other complex of forms and ideas which seriously rivals it. Now, in a situation like this, it may be argued, it should be possible to put together a theory of architecture without very much difficulty. It is simply a question of two rather prolonged exercises in analysis and synthesis. First, of assembling the ideas, examining their common trends of meaning and reaching a series of general concepts. Second, of abstracting formal characteristics from a select repertory of modern buildings, eliminating merely modish elements and providing a grammar of form. It would then only remain to illustrate how the forms embody the ideas. The whole exercise would, it may be supposed, add up to something like a Palladio of modern architecture, a pedagogical reference book not in any way restricting further development but consolidating the achievements of modern architecture, clarifying them and providing a departure platform for new experiments.

Such is the *prima facie* case for a specific theory of modern architecture. I have tried to make it sound plausible but of course it is hopelessly gimcrack. Only imagine for a moment the task of isolating characteristically modern forms from whole buildings. Only imagine the horror of stirring around in the rag-bag of aphorisms, platitudes and fancy jargon and trying to determine their common trend and resultant meaning. The imagination boggles, and when it does that it is a sure sign that something stupid is being attempted. So let us leave this whole enterprise and look for firmer ground on which to start our enquiry.

We had better consider first what is in our minds when we think about a 'theory' of architecture. The elementary meaning is a conspectus of knowledge in any particular field. A theory of architecture may be, like many of the treatises of the 18th century, purely encyclopaedic, without any explicit philosophical orientation at all. It may be, like Julien Guadet's famous work,[1] a series of discursive studies of types and elements, in lecture form, within a closed tradition whose validity is taken for granted. Or it may be of that curious kind represented by John Belcher's well-known book[2] of half a century ago in which a list of interesting words is compiled (scale, vitality, restraint, refinement, etc.) each providing the title for a short essay which gives it a glow of meaning, without ever reaching down to fundamental concepts at all.

But I suspect that what is in our minds when we talk about architectural theory now is something both less extensive and more profound than these—a statement of related ideas resting on a philosophical conception of the nature of architecture—in short, *principia*. Since Alberti wrote his *De Re Aedificatoria* in the middle of the 15th century there have been a certain number of statements of this kind, though not (when all derivatives are written off) quite as many as you might think and few, mercifully, as difficult to understand as Alberti. They are usually to be found lodged in some section of an encyclopaedic work (e.g. Alberti, Lib.ix) or forming introductions to a course of lectures (e.g. Durand) or, more rarely, as independent polemical essays (e.g. Laugier). It is worth emphasising that to state the principles of architecture does not at any time take very many words. It is the demonstration by historical instance and the exposition of grammar which fills up the tomes. This evening my quest is for statements of root principle.

If we review the statements of principle which have attracted attention in the course of the last five hundred years we may be struck by the fact that they are much more easily related to each other than they are to the architecture prevailing at the time they were written; which suggests that just as architectural style has evolved from generation to generation, each changing the favoured accentuation of the last, so architectural thought has developed phase by phase with its own dialectic. There has been, in fact, an evolving process in theory just as there has been in style and the two processes have not made anything like the same pattern. Each has been and is in fact autonomous, to the extent that it would be possible to write a history of architectural theory without reference to a single actual building and even a history of architectural style without a single reference to architectural theory—though I am not suggesting that anybody should try.

The actual relationship of architectural theory to architectural production at any given time is problematic. It is perfectly possible for a new idea to be announced, cherished by one generation, turned upside down by the next and only in a third to be validated in architectural designs. Something of the sort happened with the 18th-century idea of rational architecture, to which I shall refer later on. On the other hand it is possible for architectural style to be revolutionised without so much as one corollary gesture on the plane of theory. Who has ever had a more powerful effect on architecture than Michelangelo? Yet his effect on the *theory* of architecture was nil. So we must bear in mind about theory that it is an historical process with a life of its own in its own medium of words and that there is no question either of principles being abstracted wholly from practice or of practice being necessarily a reflection of theory. This makes a pretty big hole in the proposition called 'A theory of modern architecture'. But it brings us nearer to a realistic view of what we are discussing.

In the present century a fairly large number of books—I make it about 120—have been written about the nature and principles of architecture. Up to 1925 there was a modest issue of one book a year but in 1926 at least seven books (English, American and French) appeared, though oddly enough not one of these recognised that any fundamental changes were taking place in architectural thought. The general tendency before 1927 was to re-write the principles then stagnating in the Beaux-Arts tradition and to comment on them in essay style, but I do not know of a single book which investigated those principles historically or attempted to evaluate them philosophically (there is one out-

standing exception which I will mention in a moment). After 1927 books stating the modern point of view began to appear. Between that year and the present there have been statements from Behrendt, Lurçat, Taut, Cheney, Platz, Hitchcock, Duncan, Gropius, Moholy-Nagy, Teague, Giedion, Fry, Saarinen and Zevi, to mention only some of those who have produced books; to collect the statements appearing in the form of papers, articles and catalogue introductions would be a mighty exercise in bibliography. The general character of all this writing is enthusiastic and propagandist. The authors tend to start with a belief in the new architecture and to write around their beliefs supporting them by picturesque and forceful analogies. Only rarely does one detect a realisation that architectural thought is a continuing activity *sui generis* in which what is new must be distinguished by criticism of the past. But there are a few books of great penetration and to some of these we must now pay attention.

I suppose nobody will doubt that Le Corbusier's *Vers une Architecture*[3] has been the most consequential book on architecture written in this century. Published thirty-four years ago, it is still widely quoted and quite frequently read. It is not and does not claim to be a theory of architecture. It is a series of critical essays, reprinted in the order in which they first appeared in *L'Esprit Nouveau*, starting in October 1920. In the whole course of these essays nothing absolutely new is proposed in the way of architectural principle, but a great deal that had been forgotten is brought into the light of the present and exhibited with a quite uncommon flair for paradox. I think it would not be an unfair generalisation to describe *Vers une Architecture* as a critique of the French rational tradition—a critique marking a new phase in that always vigorous and controversial zigzag of thought. This French rational tradition is not, of course, the Beaux-Arts tradition personified in Guadet, for which Le Corbusier expresses a good deal of contempt. It is, on the contrary, the tradition first of Jesuit intellectuals in the early 18th century, later of rebels and academy-haters, and indeed 'tradition', which suggests a handing-down of embalmed principle, is not at all the right word. It is an historical process advancing by a series of contradictions and reassessments, of which latter *Vers une Architecture* is the most recent. As I am going to suggest that this rational process is still a vital element in the contemporary theoretical situation perhaps I may briefly explain what I understand it to be.

It all hinges on the ancient body of Mediterranean beliefs, re-stated by Alberti;[4] and the hinge occurs in the age of Descartes. One could date its origin rather pedantically from Perrault's critique of Vitruvius.[5] It is picked up in the 18th century by the Abbé Laugier[6] whose two essays were the standard statements for half a century. But in 1802 Laugier was attacked as a muddler by Durand[7] who presented his students at the Polytechnique with an altogether tougher and more materialistic case. So far, the argument had proceeded against a background of belief in classical antiquity, but then, fifty years later, Viollet-le-Duc[8] took up a new position, still rationalist but transposing the background from classical to mediaeval antiquity and purporting to show that the 13th century was the sole repository of rationalist principle. Viollet-le-Duc was, directly or indirectly, the inspiration of many of the pioneers of the modern movement: Berlage, Horta and Perret among them.

This is, of course, a grotesque simplification indicating only some of the more obvious peaks in a great range of argument. Many more names should go in, not all of them French: there is Cordemoy;[9] there is the mysterious Venetian rigourist Lodoli[10] whose influence is hard to estimate because he never wrote anything down; there is Frézier,[11] the engineer; there is half-French Pugin.[12] Again in rough caricature, one could sketch the process like this. Perrault said antiquity is the thing and look how rational; Lodoli seems to have said rationalism is the thing, down with antiquity; Laugier said up with *primitive* antiquity, only source of the rational; Durand said down with Laugier, rationalisation means economics; Pugin said down with antiquity, up with Gothic and look how rational; Viollet-le-Duc said up with Gothic, prototype of the rational. Eventually a voice is heard saying down with all the styles and if it's rationalism you want, up with grain-elevators and look, how beautiful!

Well, now, in this process, which I take to be the main heritage of the modern theorist, there are certain essentials which hold their own throughout. At the bottom of it all is the axiom that architecture is an affair of simple geometric forms—regular solids[13] and their elementary divisions. This is inherited from Italian tradition and has a peculiar history of its own, passing from the quasi-mediaeval numerology of Alberti to the visual objectivity of the Cartesian world and on to the emphatic apprehensions of the revolutionary school of Boullée and Le Doux. In some form or another it is always there.

Then there is the rational issue whose course through the 18th and 19th centuries I have already sketched.

But there is also the question of antiquity and the measure of its authority and one very important thing about the whole rational process is that it tends to exclude antiquity as an *absolute* authority. However, antiquity was obstinately there all the time. Only the theorists who never designed anything, like Lodoli and Laugier, could be really tough about antiquity. Those who designed had, in one way or another, to admit it for the important reason that the forms of classical antiquity or (in the 19th century) mediaeval antiquity, provided something which is essential to the creative designer—a bulwark of certainty, of unarguable authority on which his understanding leans while his conception of the building as a whole, as a *unity*, takes shape. The most interesting, indeed the dominating question, in a search for the modern *principia* is: where, if not in antique forms, or some equivalent substitute, is the source of unity?

Le Corbusier provides no answer to this in *Vers une Architecture*. There is no reason why he should. The book is really nothing but a lightly-etched reminder ('Trois rappels' is the title of the first chapter) of the main content of the rational process and it contains few ideas which could not be traced back into the line from Perrault to Viollet-le-Duc.

Le Corbusier's designs, let me say in parenthesis, are a different thing altogether. I have already said that architectural theory and architectural style are things apart—each with its autonomous life and this is nowhere more obvious than in the case of the author of *Vers une Architecture*. His conception of theory is simply the solid intellectual platform, with foundations deep in the past, on which he stands to do something which has nothing to do with the past whatever. Le Corbusier has not *reasoned* himself into those architectural conceptions which have so profoundly influenced the expression of modern building. Nor is there any mystery about how they have come about, for it is by now an accepted fact of contemporary art-history that Le Corbusier's vision in the early days was that of the modern painters—the school of Picasso, Braque and Léger; that after they had discovered the power of converting the commonplace into pure conceptual painting, Le Corbusier discovered the power of composing the commonplaces and crude ingenuities of industrial building into equivalent architectural realities. But there is nothing in *Vers une Architecture* about that; and if the pictures of the author's own works were eliminated from the book it might easily be construed as foreshadowing some frozen neo-classicism not far removed from that of Auguste Perret.

Obviously, the only thing about *Vers une Architecture* which helps us to envisage a case for a specifically new theory of architecture is the re-illumination of principles already established. If we were to argue from the example of Le Corbusier alone we might well conclude that the theoretical process stemming from antiquity and the age of reason was, in one form or another, the theory appropriate to the modern movement in architecture. That *may* indeed be the case. But we cannot leave the matter there for in another quarter altogether there have been theoretical inquiries of considerable importance and entirely different character. I am thinking of the sphere of thought represented by the Bauhaus.

Bauhaus thought has been pretty copiously manifested: in Gropius' own writings, in writings about Gropius and the Bauhaus and in the Bauhaus-bücher of the 'twenties. But for anything like a systematic exposition of Bauhaus theory the most significant book is Moholy-Nagy's *The New Vision: from Material to Architecture*, based on lectures given at the Bauhaus in 1923–28. These lectures were given after *Vers une Architecture* had been published but they

owe nothing to it, nor to the *Esprit Nouveau* circle from which it emerged. Moholy, of course, was a totally different kind of person from Le Corbusier—he represents in a fundamental sense that phenomenon of our time, the displaced person. Le Corbusier's Swiss background was happy and stable. Moholy's Hungarian background was far otherwise and when Le Corbusier was building a luxury villa on Lake Geneva, Moholy was pitched into a hideous and incomprehensible war without even the consolation of being on the winning side.[14] It is not surprising that whereas Le Corbusier turns naturally to a reassessment of the past, Moholy turns his back on it altogether. I do not know how conscious he was of turning his back on Le Corbusier but his book is in some respects a negation of *Vers une Architecture*. Admittedly he states what he calls the 'basic law' of design as the obligation 'to build up each piece of work solely from the elements which are required for its function',[15] a statement which is the genuine old-style rationalist article (it could well be a quotation from Laugier), but he then instantly declares that the basic law has limitations and he proceeds to search for an ultimate authority.

This ultimate authority is of course likely to be the source of unity of which I have already spoken. It is the *something* occupying the place which used to be filled by 'antiquity'. What is it? Moholy says it is 'biological'. The artist's freedom, he says, is 'in the last analysis determined biologically'. The words 'biological', 'biologically' crop up again and again throughout the book. 'Architecture', he says, 'will be understood . . . as a governable creation for mastery of life, as an organic component in living.' 'The standard for architects . . . will revolve around the general basis, that of the biologically evolved manner of living which man requires.' And, finally, 'architecture will be brought to its fullest realization only when the deepest knowledge of human life as a total phenomenon in the biological whole is available.'[16]

This preoccupation with biology and with the organic is obviously a very important issue in our investigation. The word 'organic' especially has had an almost magical significance for architectural writers ever since Louis Sullivan wrote of it fifty odd years ago as 'a word I love because I love the sense of life it stands for, the ten-fingered grasp of things it implies'.[17] That is not a very scientific statement but I have not yet found, among the many writings about organic architecture, any statement that is. Yet it is constantly used as an ultimate, as if organic values (whatever they may be) were absolute values.

Moholy's treatment of the biological idea is more interesting than most since he presses it harder and, in doing so, shows, in one direction, its perilous inefficiency. When he declares that the artist's freedom is 'in the last analysis determined biologically' he leads us surely to a determinism which begs the whole question. Moholy would like to construct a theory which is a perfect description of practice—which coincides with practice. He cuts himself off from inherited theory and postulates a new theory which would fit the biological (let us say psychophysical) needs of man like a glove. I suppose, if the most far-reaching implications of cybernetics were realised, if the artist's functions were at last to be explicable in mechanistic terms, some such theory might be arrived at. But that is such an awfully long way off that it is hardly worth considering in relation to the modern movement now in course of evolution; and in any case I doubt if anybody yet sees the determination of the artistic needs of society as even a remotely possible point on the scientific horizon. Notwithstanding the fine perceptions and immensely valuable practical suggestions contained in Moholy's book, it seems to me that his insistence on the biological is a premature and purely verbal closure of the subject of modern architectural theory. It gives nothing to hold on to but this elusive myth of 'biological' finality.

Those who have written about 'organic' architecture have usually gone in a rather different direction from Moholy's. Frank Lloyd Wright's use of the expression 'organic architecture' is generally considered to be his own emotional tag for all fine, free and humane architecture but especially for that of Frank Lloyd Wright. Behrendt, Steinmetz, Saarinen and others have speculated on the 'organic' in desultory philosophisings. Bruno Zevi has investigated various recent uses of the word and in his book, *Towards an Organic Architecture*, devotes a whole chapter to 'the meaning and scope of the term organic in reference to architecture'. He does not discover any evidence of strikingly profound thought on the subject; nor does he commit himself to any precise meaning. But he does write off various spurious or out-moded interpretations and, at the end of his study he does, in a single, rather casual remark, hit what I conceive to be the nail exactly on the head. He says that the organic conception of architecture is based 'on a social idea and not on a figurative [I take it he means formal] idea'.[18] That rather wide interpretation would, I suspect, command almost universal agreement.

Zevi throws out this comment as if its truth was pretty obvious and I suppose it is, but I want to underline the proposition and see how it relates to the picture of the developing theoretical process which I have outlined. I suggested a few moments ago that although the rationalist writers of the 18th and 19th centuries tended to exclude antiquity as the ultimate authority, antiquity remained insistently there as the *source of unity*, the focus at which the architectural design was realised. Where, I asked, if not in antique forms, can the source of unity lie? Zevi's remark points to the answer. The source of unity in modern architecture is in the social sphere, in other words in the architect's programme.

From the antique (a world of form) to the programme (a local fragment of social pattern): this suggests a swing in the architect's psychological orientation almost too violent to be credible. Yet, in theory at least, it has come about; and how it has come about could very well be demonstrated historically. First the rationalist attack on the authority of the antique; then the displacement of the classical antique by the mediaeval; then the introduction into mediaevalist authority of purely social factors (Ruskin); then the evaluation of purely vernacular architectures because of their social realism (Morris); and finally the concentration of interest on the social factors themselves and the conception of the architect's programme as the source of unity—the source not precisely of forms but of adumbrations of forms of undeniable validity. The programme as the source of unity is, so far as I can see, the one new principle involved in modern architecture. It seems to be the principle which can be discerned through the cloud of half-truths, aperçus and analogies which is the theoretical effluent—not a very nice word, I'm afraid—of the modern movement.

Whether you accept this statement as a basic principle and a specifically modern principle depends upon a number of things. Mainly, there is the question, what a 'programme' is. A programme is a description of the spatial dimensions, spatial relationships and other physical conditions required for the convenient performance of specific functions. It is probably impossible to write out a satisfactory programme without a certain number of architectural relationships being suggested on the way and the character of these relationships may well be something different from the relationships in a predetermined stylistic discipline. The chief difference is that they involve a process in time. It is difficult to imagine any programme in which there is not some rhythmically repetitive pattern—whether it is a manufacturing process, the curriculum of a school, the domestic routine of a house, or simply the sense of repeated movement in a circulation system. Of course this pattern does not dictate a corresponding pattern in the architect's plan or anything crude like that but it does sanction relationships which are different from those sanctioned by the static, axially grouped dominants and subordinates of the classical tradition—different, but carrying an equivalent authority. The resultant unity can, I think, quite reasonably be described as a biological or organic unity, because it is the unity of a process. Moholy-Nagy[19] and after him Giedion[20] would see it as a space-time unity and you will recall Giedion's brilliant analogies between modern architecture and the concepts of modern physics on the one hand and the Picasso revolution in modern painting (involving the concept of simultaneity) on the other. Not that such analogies prove anything; and there is always the danger that they may seem to prove far too much; they are phantasms of the *zeitgeist*. The actual reason why the principle embodied here is new is this. It is only in the past half-century or so that the programme has ceased to be evaluated merely *quantitatively* and has come to be evaluated *qualitatively*. This has to do with the fact that programmes have become more

complex, more challenging and therefore more susceptible to qualitative generalisation and evaluation. It has also to do with very much wider issues involved in the social revolutions and re-orientations of our time.

If we accept this principle—unity deriving from the programme—as truly a basic principle of modern architecture, how does it look when lined up with the inherited principles which we found that Le Corbusier had re-illuminated in *Vers une Architecture*? Here comes the crux of the whole matter. The conceptions which arise from a preoccupation with the programme have got, at some point, to crystallise into a final form and by the time the architect reaches that point he has to bring to his conception a weight of judgment, a sense of authority and conviction which clinches the whole design, causes the impending relationships to close into a visually comprehensible whole. He may have extracted from the programme a set of interdependent relationships adding up to a unity of the biological kind, but he still has to face up to the ordering of a vast number of variables, and how he does this is a question. There is no common theoretical agreement as to what happens or should happen at that point. There is a hiatus. One may even be justified in speaking of a 'missing architectural language'. Gropius[21] has stated the difficulty as the lack of an 'optical "key" . . . as an objective common denominator of design'—something which would provide 'the impersonal basis as a prerequisite for general understanding', which would serve 'as the controlling agent within the creative act'. That is a precise description of the functions served by antiquity in the classical centuries! The dilemma is really an enlargement of the flaw already apparent in mid-18th-century theory—the flaw that while antiquity was eliminated as an absolute, nothing was introduced which took its place as a universally accredited language of architectural form.

The flaw seems now to have widened into a veritable dilemma. Can it be resolved? Well, I can think of two possible approaches to its resolution. The first involves an extension of the rationalist principle into the sphere of engineering, and the second involves a reconsideration of the geometrical basis and limitations of architecture.

Let us take the engineering question. The engineer is the heir to the basic tenet of the old rationalism—economy of means in construction. So long as traditional methods prevailed the architect could keep his eye on this ball, or at least persuade himself that he was doing so; but with the development of the science of the strength of materials and the application of mathematics to design he was rapidly overpassed by the engineer. The engineer ran away with the rationalist ball. It is no use pretending that we can lop off this issue as a stray limb of the rationalist process which has got outside the scope of architecture, because if we let the rationalist principle go modern theory collapses in a heap. No. It is necessary to declare that no theory of modern architecture can be logically complete which does not postulate the collaboration, immediate or remote, of architect and engineer; and here collaboration must stand for the design of components in factories as well as the personal achievements of a Nervi or a Candela.

But let us be clear about what the engineer's role really is and how different it is from that of the architect. For the architect, the source of unity for his design is, I have suggested, the programme. The engineer seeks unity in another way and another direction altogether. He seeks it within one component—even if it is a very complex component comprising the whole sectional trace of a large building. And it is a unity of interdependent calculable issues adding up to a total whose criterion is performance. His search for finality and the architect's are as wide apart as they can be. It would be altogether too facile to suggest that they are even complementary. Nevertheless, a whole view of architecture must necessarily extend to this latest metamorphosis of the rationalist process in the hands of the engineer.

The idea can be and sometimes is upheld that the engineer, as a result of his enforcement of the rationalist principle, invents forms and formal arrangements which the architect then absorbs into his vocabulary of expression and uses, sometimes in a strictly engineering way—and sometimes not.[22] This certainly happens. But the engineer is concerned strictly with components and although he may contribute significant inventions he cannot contribute a continuously related system of inventions—i.e. a language.

Thus the engineering issue does not wholly resolve the dilemma of modern architectural theory, and so we turn to the ancient axiom that architecture is fundamentally concerned with the regular solids and simple ratios. It is getting to have an old-fashioned look, this axiom, especially in an age which has discovered geometries other than Euclidean. Moholy-Nagy was eager to go behind the axiom to 'biological assumptions'. Mr. Banham, in a recent article,[23] has offered us the attractive red-herring (I think it's a herring) of topology. In the field of practice, unfamiliar and complex forms are cropping up. Candela has built a concrete church in which all the surfaces are hyperbolic paraboloids. But surely the axiom stands as an over-all absolute necessity. Even if plans wriggle in the wildest of 'free' curves, even if engineering science introduces forms of great precision but visually unreadable complexity, we shall always seek to read through the complex to the simple, to seek the assurance of those simplicities which must be implied even when they are not stated. Very well. On this principle of geometrical absolutes it is possible to erect systems or disciplines to guide the architect towards that final ordering of form which he must achieve. Of these systems the most celebrated is Le Corbusier's *Modulor*. But the *Modulor*, like any other apparatus of the kind, is a system of control, not of expression (Le Corbusier says this as clearly as it could be said). It is not a language. And if I say that in my opinion the erection of proportional disciplines—purely intellectual contrivances—does bring the *principia* of modern theory into satisfactory relationship to each other and to actuality, it may well be objected that this theory excludes almost everything that has been most valued in the art of architecture as a means of expression in the past three thousand years. In answer to that, I have two things to say. The first is that if you accept the principle that the programme is the source of unity, the crucible of the architect's creative endeavour, you cannot postulate another principle, another crucible, at the other end of the designing process to satisfy the architect's craving for conspicuous self-expression. You cannot have it both ways. You certainly cannot have two sources of unity. Either the programme is or it is not the source. It is part of my case for a theory of modern architecture that it is the source. If you do not accept this case, I think you must consider whether, after all, architectural theory does not stand very much where it stood in 1920, or 1800, or even 1750, and whether the position of an architect who is concerned about expression or style is not that of a man feeling his way back to classicism or neo-classicism, or, to put the finest possible point on it, crypto-neo-classicism.

The second thing that I would say is that it is quite possible that the missing language will remain missing, and that in fact the slightly uncomfortable feeling which some of us have that it ought to exist is nothing but the scar left in the mind by the violent swing which has taken place in the lifetime of one generation from an old order of principles to a new.

I have tried to demonstrate that in the light of all that has been written on architecture in the past thirty years a specifically modern theory of architecture does exist, and that it exists not as an arbitrary invention of our time but as a new stage in the long evolution of theory since those forgotten men whom even Vitruvius knew as the Ancients. Modern theory is part of the history of ideas. It is, I believe, only as the history of ideas that it can be taught. The main thing is to get that history right and to get it clear. It would be an outrageous assumption on my part that I have done either this evening, and I have certainly been more speculative than historical. I have presented what I feel may prove to be an exceedingly vulnerable thesis. I thank you for listening to me with such patience.

References

1. Guadet, J., *Elements et Théorie de l'Architecture* (5th ed., 1909).
2. Belcher, J., *Essentials in Architecture* (1907).
3. Le Corbusier, *Vers une Architecture* (1st ed., 1923). Trans. as *Towards a New Architecture* (1927 and 1946).
4. The *De Re Aedificatoria* was written about 1450. The standard English translation is that of G. Leoni (1726 and 1739); it is available in a reprint (ed. J. Rykwert, 1955).
5. Perrault, C., *Les Dix Livres d'Architecture de Vitruve* (1673), Bk. V, cap. i (note 1) and Bk. VI, cap. v (note 8). These references are quoted by F. Algarotti, *Saggio sopre l'Architettura* (Vol. 3 in the *Opere*, 1791) as predictions of the rationalist attitude.
6. Laugier, M. A., *Essai sur l'Architecture* (1753) and *Observations sur l'Architecture* (1765).

DISCUSSION

Dr. Jacob Bronowski, M.A.: Mr. Summerson's thoughtful and elegant discourse contains so many references to cybernetics, non-Euclidean geometry, topology and so on that in moving a vote of thanks to him you may expect me to thank him in scientific terms. I do not propose to do that; I would rather take as my starting-point a thesis not unlike his, which was propounded in 1798 in the field of poetry. In that year Wordsworth and Coleridge published the *Lyrical Ballads* and revolutionised both the theory and the practice of poetry—two distinct fields, in exactly the sense in which Mr. Summerson distinguishes between the theory and the practice of architecture. Wordsworth said in later life that every great poet had to create the taste by which he was appreciated, and it has been equally true of modern architecture that it has had to create the taste by which it has been appreciated. Wordsworth said that the poetry of the 18th century was artificial and that he proposed a simple poetry of words in their natural order. The modern revolution in architecture, and indeed every revolution in every art, has pointed out that the preceding age has been artificial and that it was simple and natural.

What Mr. Summerson has done this evening is to trace—I thought in a very interesting way and with great skill—the stages by which this has been done, by Le Corbusier, by the Bauhaus, and now by Mr. Summerson. The 'rationalism' which he ascribes to Le Corbusier is, of course, exactly what Wordsworth meant when he spoke of 'simplicity' and of 'words in their natural order'. It means essentially a functionalism, and it sets out from the proposition that somehow the function of the building determines everything about it.

What we have learned in the 35 years that have passed is that functionalism is necessary but that functionalism is not enough. When Moholy and the Bauhaus invented all that difficult language about organic architecture, they seem to me to have been following Wordsworth when he stopped talking about 'simple language' and talked about 'natural and passionate language'. To my mind, what the Bauhaus always meant was that man had evolved in a certain way, and that it was no use talking about a building as being functional unless in some way a building for human beings was different from a building designed to house animals in the Zoo.

I do not have to remind you that there is a classical phrase of Le Corbusier's about a house being a machine for living. If Moholy improved on this, it was by saying that a house was a machine for *human* living. We have heard this evening an exposition—and one of a set of similar expositions which, of course, are in the air at the moment—that something more is wanted even than this, and that when you have talked about human living you have not said enough to enlarge functionalism into a real method.

I was most interested that the criterion which Summerson used was that of the unity of the building, and this he derived from what he called the programme of the building. This was to provide a unity which the great examples of the past no longer give it. If I understand this—and I hope that I do, because I feel very sympathetic towards it—then it is really equivalent to placing on the architect the onus not only to make a machine for living and a machine for human living, but a machine for the specific kind of living which goes on in a society carrying out certain functions. I regard this as a very important thought.

It happens that I have just written in another context a phrase which I should like to quote. I said that 'Knives and forks are not only tools for eating, but tools for eating in a civilisation which eats with knives and forks, and this is a very complex civilisation'. In the context of tonight's paper, I could paraphrase that by saying 'A house is not only a machine for living, but a machine for living in a civilisation which lives in houses, and this is a very complex civilisation'. It seems to me that this opens up the transition on which Summerson touched towards the end of his talk between the primitive dots and dashes of the telegram which the engineer provides and the language in which an architect has finally to express not only functional relations but, with Moholy, human relations, and, in this context, social relations. This is really an attempt to give up 'telegraphese' as the vocabulary of modern architecture and to find a language for modern architecture.

I have found this a most stimulating and warming attempt, and I hope that you will join with me in thanking Mr. Summerson for it, and in particular thanking him for phrasing it himself not in telegraphese but in warm and living language.

Mr. Michael Pattrick [*F*]: I am very pleased to have been asked to second this vote of thanks, because it gives me an opportunity of saying in public something which I have thought for very long in private, and that is that of those qualified to talk about architectural theory John Summerson is quite obviously pre-eminent. He has a charming way of intermingling unquestioned logic with an occasional and almost impishly provocative remark which is exactly right to start off an argument. He says himself that his paper is vulnerable, but that, I suspect, is merely a ruse to draw the enemy's fire. Those who do battle with Summerson on matters of architectural scholarship do so at their own risk, for he has a most disarming way of spoiling any frontal attack by adroitly stepping aside.

Some of you may remember that a few years ago we had a most interesting paper here on Mannerism. When it was over, most of the audience sat virtually spellbound while the speaker and a few select historians bandied about the names of the most obscure architectural examples in a way which would make Stephen Potter realise that he had not lived in vain. Each instance given was brilliantly returned, until at last set and match went to Summerson, who announced that he had never even heard of the last illustration which the speaker had called to mind.

Tonight I am sure that Summerson was wise to abandon at the outset any attempt to build a common denominator out of prevailing practice and theory. I liked particularly his allusion to 'the horror of stirring around in the rag-bag of aphorisms, platitudes and fancy jargon'. We shall always be indebted to him for the fact that never at any time does he allow his own writing to be sullied by anything which could possibly be construed as 'fancy jargon', which is currently so popular. He reminds us that it does not take many words to state the principles of architecture, and it is thus all the more important to have them carefully chosen.

With his historical exposition I certainly would not dare to disagree. I am also willing to believe that an organic conception of architecture is one which is based upon a social idea; but if it is implied that this alone provides an underlying unity, then I personally do not find myself so easily convinced. The social idea may be a new factor brought into the equation, but surely the part which it has to play is rather limited? Organic architecture can and does produce a sort of unity, but is not it a unity *en masse*, occurring in the same way that a severely limited range of material brought unity to a mediaeval town? It does not of itself produce any sense of completeness in the individual building, or even in a group of buildings.

Summerson admits later that, having extracted from the programme a set of independent relationships which may add up to unity of a biological kind, the architect still has to face up to the ordering of a vast number of variables. As we all know, it is often in the ordering of these variables that the trouble really starts. I feel that this particular mode of approach may be just another path leading us up to the starting-point, where creative design has to begin. Further, he says that 'It is difficult to imagine any programme in which there is not some rhythmically repetitive pattern',

7. Durand, J. N. L., *Précis des Leçons d'architecture données a l'école Polytechnique* (1802).
8. Viollet-le-Duc, E., *Entretiens sur l'Architecture* (1863–72).
9. De Cordemoy, *Nouveau Traité de Toute l'Architecture* (1714).
10. For Lodoli see Kaufmann, E., *Architecture in the Age of Reason* (1955), pp. 95–9.
11. Frézier, *Dissertation sur les Ordres d'Architecture* (1738).
12. *The True Principles of Pointed or Christian Architecture* (1841) is a plea for Gothic as a rational style.
13. Dr. J. Bronowski warns me that 'regular solids' in a strict sense includes figures never regarded as basic to architecture and excludes others which are. Time forbids reconsideration but, with this warning, my meaning will not, I think, be misunderstood.
14. For biographies of Le Corbusier and Moholy-Nagy, see Gauthier, M., *Le Corbusier, ou l'Achitecture au Service de l'homme* (1944) and Moholy-Nagy, S., *Moholy-Nagy: experiment in totality*, (1950).
15. *The New Vision*, p. 54.
16. *Ibid.*, pp. 159–60.
17. *Kindergarten Chats* (1947). Elsewhere (p. 47) Sullivan uses 'organic' to mean that 'the part must have the same quality as the whole', an idea which goes back to Alberti.
18. Zevi, B., *Towards an Organic Architecture* (1950), p. 76.
19. *The New Vision*, p. 163.
20. *Space, Time and Architecture* (3rd ed., 1954), p. 432.
21. *Scope of Total Architecture* (1956). p. 49.
22. For a discussion of this point by an engineer, see Ove Arup, 'Modern Architecture: the Structural Fallacy', in THE LISTENER, 7 July 1955.
23. 'The New Brutalism', in ARCHITECTURAL REVIEW, December 1955.

and, what is more important, he says that this pattern 'does sanction relationships . . . carrying an equivalent authority' to those previously sanctioned by axial planning. Surely axial planning only has any authority in that it is related to geometrical form? Geometry is something which is ageless, and the organic approach and the social idea have to be related to a moment in time. One is an intellectual idea undoubtedly valid in itself, and the other is a physiological fact.

In making these remarks I do not wish to appear to minimise in any way the effect of this paper, which I consider is immensely valuable. I was pleased that in his quest for a missing language he mentioned the engineer. The engineer's role is a conspicuous one, but it is entirely different from that of the architect. Some engineers, though not, I think, those very eminent in their profession, have recently suggested that they could quite well take on the architect's task in addition to their own. If any of them happen to be present this evening, I am sure that they will have enjoyed hearing one or two of the things that an architect has to think about on his way to work.

Mr. Summerson did not deal at all with the intuitive approach, and perhaps does not consider it worth taking into account, though we frequently hear a wish for the integration of architecture with painting and sculpture. Those who rely on intuition or who look for an example in ideas which belong to a separate art may be constructing a language of design, but it is a language intelligible to themselves alone.

The position of the architectural teacher in all this is not easy to see. Undoubtedly he is hopelessly caught up in the dilemma, or, if not, he ought to be. He cannot just stand aside and wait for somebody to produce an argument which has universal acceptance. He is expected to offer guidance and criticism. He must have a point of view and establish in his own mind a basis for criticism. The fact that his theory is an individual one rather than universal may be his misfortune, but in the present circumstances it is certainly not his fault.

In this connection Mr. Summerson has given us a most valuable piece of advice in the warning that we should not attempt to explain current practice in terms of current theory. Those who came here this evening expecting a complete set of rules will have to go away empty-handed, but his 'No' to the complete language was, I feel, a qualified one, and I was relieved to hear that he does feel that the gap is at any rate partly closed by geometry, and the fact that the present era has discovered geometries other than those based on Euclid does not in any way weaken the ancient axiom that architecture is fundamentally concerned with regular solids and simple ratios. After all, that is our only link with the past and in fact our only hope of making any sense out of the present.

It only remains for me to say how much I have enjoyed this paper and to welcome once again the opportunity of seconding this vote of thanks.

Mr. Reyner Banham: I am one of those who live in the rag-bag, and I paddle in the effluent with the red-herrings. I am impressed by the fact that there is a very big man in here with me. He is dead, and therefore almost by definition a Gold Medallist of this Institute. His name is Choisy, and I cannot think how he got left out of this paper. He was the last of the great French rationalists, coming at the turn of the century, and his influence is almost endemic after the turn of the century. He is worth a quick look, because he advanced a theory of architecture in which there is no difference at all between theory and practice. For him, everything good in architecture was determined by pure necessity. He points out, for instance, that the slope of a Doric gable is settled by the fact that the water must run off and the tiles must not. What he talks about is not architecture at all, as we know from this paper, but engineering.

After Choisy there is a real gap between theory and practice, but it is not an unoccupied gap; it is filled by the missing language which has now become a dead language, the language of symbolic forms, otherwise known as the regular solids. Le Corbusier himself, in *Urbanisme*, pin-points these solids as being good, and, what is more, better than irregular forms. They were equally of value to the Bauhaus and to Moholy, though he talked about the biological approach. The story is told of someone who designed a piece of glass of an organic pear-drop shape and who was asked by Moholy 'How can you betray the Bauhaus? We have fought for simple forms, the cylinder, the cone and the cube.' There is no doubt that on both sides in the theoretical background of the 'twenties there was a common language, this language of elementary geometrical forms.

But it had a trap in it; it was also the language of architectural analysis at that time. If you wanted to think about a programme you thought of it in terms of squares, oblongs and circles. When Gropius was thinking about the Bauhaus teaching programme he thought of it in terms of neat rectangular rooms or drew rectangles and circles connected by long straight lines, like the circulation diagram of a Hertfordshire school. Once you started to think about the programme of the building you were committed to a set of symbolic forms. That language began to die at the end of the 'twenties, and Corbusier abandoned it in 1932. That is why we dragged topology into the discussion. It is a-formal, and provides a method of analysis that does not commit you to any particular set of forms. And when you think in terms of relationships that do not predicate any particular geometry or symbolic forms, then you must think of them for yourself—and as an art historian I wish you joy of it!

Mr. Peter Smithson [*A*]: Perhaps the only contribution which I can make is to show in the life of an active architect what place theory takes. I have constructed what I call a theory-practice cycle. This cycle is being pedalled along and both wheels, practice and theory, revolve simultaneously. My theory-practice cycle begins, I suppose, by assuming that everything starts with a revolution. There is an existing thing against which discontent is felt. This discontent hardens, and at some point, intuitively a new image is conceived. This image is not an isolated thing, concerned purely with the plastic arts, but a sort of social-plastic entity; that is, it conceives a new way of life, a new sort of technology and a new image all in one, but in rather a vague sort of way.

What happens next is a period of cerebration or rationalisation in which this intuition is given a theoretical basis and an effort is made to give the plastic image more distinct form. This is the period of architectural theory, and that leads to the production of actual work. This period is followed by normalisation or practice. By this time the new image has penetrated to all spheres of related activity, and the original impulses become so weakened that it becomes, ultimately, academic. The final stage is academicisation, from which we get a new discontent and the cycle begins all over again.

Now, where are we in this cycle? Where have we pedalled to? I think that the old-type modern architecture is stuck between practice and discontent; it is round about the academicisation point. The new modern architecture is at the point between the image (that is, the feeling intuitively towards a new social-plastic entity) and rationalisation, which means that there is a great deal of talk going on and rag-bagging and new words being invented, because we are trying to hammer out what it is all about. We have a position where the 'non-squares' are between new image and rationalisation and the 'squares' are hanging around practice and discontent. This is a diagram which cannot be expressed in squares with lines between them, but must be expressed in terms of process.

This brings me to the only point which I have to make which is relevant to Mr. Summerson's paper, that 'process' has indeed something to do with the new unity for which we are looking. 'Process' does not have any overtones of 'geometry', but has overtones of collaboration, co-operation between various related techniques, and so on. What is it that the architect can offer here? What is his specific technique in this 'process'?

Architecture as something form-giving is involved in this business. It cannot be separated from 'process'; form transforms 'process' by taking part in it. To say that you can evolve a form from a social programme or from an analysis of the situation in terms of flow and so on is meaningless, because analysis without the formal content, the architect's particular specialisation, has one factor missing from it. This 'process', therefore, is more complicated than has previously been admitted.

Mr. W. A. Eden [*F*]: I should like to say how much I have enjoyed this paper. I always enjoy all that Mr. Summerson says and writes, but there is one point in this paper on which I should like to take him

up. He says, if I have understood him aright, that the programme provides the principle of unity in modern architecture, and that that is a new principle. It is on that point that I feel I must differ from him. Read Aristotle or Vitruvius or Alberti on the planning of a city; read Vitruvius on the planning of a house according to the needs of the various grades of society. Functional planning in antiquity, in mediaeval times, in Renaissance times, and in fact in all times of which we know, has been one of the principles of unity in planning; but—and I think that this is important—it is necessary to have some principle of choice between one function and another. We must know which is more important, the dining-room or the kitchen, the larder or the w.c., because it is necessary to arrange these things in space in relation to one another.

Space, immediately we begin to plan it, is not something which is just neutral. There is in every plan a most important space, and the most important element of accommodation must be put in the most important place. That process of thought leads us eventually, I think, to the question of society, what sort of society we belong to or should like to belong to; and finally it leads us to the question simply of what is man. With that thought I should like to leave this discussion!

Mr. G. E. Wickham, A.R.C.A.: Mr. Summerson is concerned about those who are teaching architecture, and I am on the outskirts of the teaching of architecture. I am not speaking because I know, but because I wish to ask, and I feel that many of us may wish to ask the same question.

From my point of view as an artist, I presume that the architect is a more practical man than myself, and the questions which he wants to ask are finally the practical ones. One of the bases on which he must form his theories is provided by the technological structure which he is going to build. I should like to ask Mr. Summerson, therefore, to enlarge on one factor which seems to me to be fundamental, the division implied by his remark that the intuitive approach, the self-expression of the architect, cannot find any place within the theory.

In a technological sense there is a division now in architecture not only in the practice of it but in what can be put into practice. We have this division in Europe and America in particular. The American architect is concerned with a building process which is highly mechanised, which has its own discipline which he has little chance to influence, while on the other hand a great deal of European architecture is concerned with a basis of craftsmanship, particularly in Italy and France. The exhibition held at the Institute recently of French architecture illustrated some of the freer forms used. That has implications not only for the architect but for the economic structure which he builds, and any architectural theory which excludes what seems to me to be this fundamental thing can have no final basis for the architect to work upon.

The vote of thanks was put to the meeting by the Chairman and carried by acclamation.

Mr. John Summerson: I think on the whole I was right in saying that my paper was vulnerable, but of the various things which have been said only one has worried me. That came from Peter Smithson, and I have been thinking about it ever since. He said something like this, that to say that forms can flow from the terms of the programme is pointless. I quite agree that I may have given the impression in my paper that I believed that forms somehow came out from the programme, but, of course, they do not. Where forms come from, as any art historian knows, is a very great mystery indeed. They come from the artist's personality, his totality of experience, and how they come is a problem of the psychology of art which I cannot go into and of which astonishingly little is known. Certainly Mr. Smithson touched on a very important point there.

I should like to thank Dr. Bronowski and Mr. Michael Pattrick for their kind remarks. I did mention in the course of my paper that theory and practice had for centuries been two rather different things. Whether or not they ought to be I do not know, but they have been in the past and still are. It occurs to me now what a particularly acute example of that continuing phenomenon is present this evening in myself, because I do not think that I have been inside an architect's office more than twice in the last ten years, and what I have offered you this evening, to be perfectly frank, is a manufactured literary thinkpiece. I am not the first literary character who has chucked a document of this kind into an architectural argument, and I do not suppose that I shall be the last. I have tried very hard to make sense of it, but do not forget that that is what it is. It comes out of the Soane Museum. I can only thank you once again for taking this offering in such good part.

Overseas Tour of the President and Secretary R.I.B.A.: Diary—II

Sydney. (16 April 1957.)

The first official engagement was to call on the Lord Mayor, Alderman H. F. Jensen, at the City Hall, at noon, accompanied by the President and Past Presidents of the New South Wales Chapter. The Lord Mayor gave Mr. Cross and Mr. Spragg the warmest welcome and presented them with autographed copies of a handsome book illustrating the buildings of Sydney. The visitors then had lunch with Mr. Cobden Parkes [*F*], the Government Architect and Past President of the New South Wales Chapter, at Wentworth House, Vaucluse, the historic home of William Charles Wentworth, one of New South Wales's early statesmen. The house is in a fine state of preservation and is full of interesting pictures, china and furniture.

The visitors were next received at Parliament House by the Premier of New South Wales, Mr. J. J. Cahill; they were accompanied by Professor H. I. Ashworth [*F*] and Mr. Greig. The chief topic of conversation was the proposed Opera House but, the division bell ringing, the Premier had to hasten off to record his vote.

In the evening Mr. Cross and Mr. Spragg were the guests at dinner of the Council of the New South Wales Chapter, at the Yacht Squadron, Kirribilli. Professor Ashworth, who was in the chair, proposed the health of the visitors; he was supported by Mr. W. R. Laurie [*F*]. Mr. Cross and Mr. Spragg replied.

17 April. The first visit was to the University of Sydney School of Architecture, where Professor Ashworth showed them some of the work of the School and introduced members of his staff. From there the visitors went to lunch at the Trocadero. Professor Ashworth was in the chair and a large number of members of the New South Wales Chapter attended. The chairman welcomed the two visitors and Mr. Cross then gave a short talk, for which he was thanked by Mr. Cobden Parkes.

After lunch Mr. W. R. Laurie took Mr. Cross and Mr. Spragg for a delightful drive around the lovely bays on the north side of Sydney. Later Mr. and Mrs. Laurie entertained them to dinner at the Australian Club, a building of character and charm, built in 1817.

18 April. Mr. John Mansfield [*F*] entertained Mr. Cross and Mr. Spragg to lunch at the Union Club and then drove them to the airport for their flight to Canberra, where they were met by Mr. Malcolm J. Moir [*A*], President of the Canberra Area Committee of the Royal Australian Institute of Architects.

Canberra. (18 April.)

A cocktail party was held at the Commonwealth Club; it was attended by many members of the Canberra Area Committee and their wives, which gave Mr. Cross and Mr. Spragg an opportunity of meeting and talking to them. After dinner Mr. F. C. Hargrave [*A*], one of the Vice-Presidents of the Area Committee, took the two visitors for a drive to the top of Red Hill, where they had a grand view of the city at night and gained some impression of its size.

19 April. In the morning Mr. E. J. Scollay [*A*] called for Mr. Cross and Mr. Spragg and drove them around the northern part of the city, where they inspected some of the buildings in the Australian National University, including the new medical research buildings designed by Mr. Scollay.

Mr. Cross and Mr. Spragg were entertained at lunch by Mr. Moir, Mr. Hargrave

and Mr. Scollay, and in the afternoon Mr. Moir, with Mr. Hargrave, drove the two visitors around the southern half of Canberra before taking them to the airport for their return flight to Sydney.

In his diary Mr. Spragg wrote: 'These short notes do not purport to deal with the architectural side of our tour, but we were very impressed with the conception of this capital city and the interesting buildings it contains. We certainly saw a great deal in a very short time.'

Auckland. (20 April.)

Professor Ashworth came to the hotel to say goodbye and Mr. Greig saw them off at Sydney airport.

They had a smooth flight to Auckland New Zealand, where they were met by Mr. G. R. C. Muston [*A*], President of the New Zealand Institute of Architects, and by Mr. Tony Curtis [*A*], chairman of the Auckland Branch Committee. Mr. Muston drove the visitors to the Trans-Tasman Hotel, and later Mr. Curtis motored them to his house, where they met a number of Auckland architects.

21 April. During the morning Mr. Cross and Mr. Spragg, with Mr. Muston, were received by the Governor-General, Sir Willoughby Norrie, and Lady Norrie at Government House, whose guests they were at lunch. Government House is an interesting old building with beautiful gardens.

After a Press interview in the afternoon, Mr. Muston drove Mr. Cross and Mr. Spragg some sixteen miles to the south of Auckland to the home of Mr. and Mrs. W. H. Gummer [*F*], who entertained them to tea and dinner. Mr. Gummer—who spent some years in the office of Sir Edwin Lutyens—is one of the senior members of the R.I.B.A. in New Zealand and was a pioneer in the work of architectural education.

22 April. Mr. Cross and Mr. Spragg paid an early visit to the Museum, which is Auckland's First World War Memorial and was won in competition by Mr. M. K. Draffin [*F*], who has prepared plans for an extension to form a memorial commemorating the Second World War. The visitors were particularly interested in the exhibits displaying Maori life and culture; they also saw the Winter Garden designed by Mr. Gummer and afterwards paid a visit to the Easter Show.

After lunch at the Kiosk in Cornwall Park Mr. Cross and Mr. Spragg went to the Parnell Swimming Pool, where they were met by the Deputy City Architect.

In the evening Mr. Cross and Mr. Spragg were the guests of Professor A. C. Light [*F*] and Mrs. Light at their house, where they met members of the staff of the University, including the Professor of Town Planning, Mr. R. T. Kennedy [*A*], recently arrived from England.

23 April. With Mr. Muston as their guide and chauffeur, Mr. Cross and Mr. Spragg started on their drive to Rotorua, breaking their journey at Hamilton where, at the house of Mr. Aubrey de Lisle [*A*], chairman of the South Auckland Branch of the New Zealand Institute of Architects, they met a number of members of the branch. They were afterwards entertained to lunch by Mr. and Mrs. de Lisle.

Rotorua. (23 April.)

The drive to Rotorua, noted for its hot springs, was through lovely country, and before reaching their destination Mr. Cross and Mr. Spragg stopped at Taniwha Springs, where they saw incredible numbers of rainbow trout so tame that they take bread out of one's hands. They also called at the house of Mr. R. Tallboys, a former President of the N.Z.I.A., where they met several of the leading Auckland and Wellington architects who were holidaying in the district.

24 April. The visitors' first call, in Mr. Tallboy's company, was to see a Maori meeting-house and church in Ohinemutu and to call upon a Maori carver who explained the symbolism of the native carving. Some of his work was inspected.

Having said goodbye to Mr. and Mrs. Tallboys, Mr. Cross and Mr. Spragg stopped to see the springs and geysers at Tikatiri before going to Moose Lodge, the house of Mr. and Mrs. Noel Cole on the shores of Lake Rotoiti, some twelve miles or so from Rotorua. After an excellent barbecue lunch the two visitors were taken for a cruise on the lake. Mr. Cole is one of the leading contractors in New Zealand and he lent Moose Lodge to the Queen and the Duke of Edinburgh so that they could enjoy some relaxation during their strenuous tour of New Zealand in 1954.

Taupo. (24 April.)

The drive to Taupo was partly through the State Forests, and just before reaching Taupo more hot springs were passed that were being developed by the New Zealand Government to produce power. The Huka Falls were also seen. On reaching the Lake Hotel at Taupo, Mr. William McKeon—a former President of the N.Z.I.A.—and Mr. Fred Harris, the Secretary of the Institute, were waiting to greet the visitors.

25 April. In the morning Mr. Muston drove Mr. McKeon, Mr. Harris, Mr. Cross and Mr. Spragg to Wellington. The first part of the route ran thirty miles along the lake, then through the National Park past the snow-capped peaks Ngaurahoe, Tongariro and Ruapehu. Later the two visitors stopped at the home of Mr. W. Thorrold-Jaggard in Palmerston North, and in his company they paid a visit to the Massey Agricultural Research College and then proceeded on their way to Wellington.

The next stop was at the country home at Waikanae of Mr. W. E. Lavelle, a partner of Mr. Muston. On approaching Wellington Mr. Cross and Mr. Spragg had some fine views of the city and harbour from the heights outside.

Wellington, New Zealand. (26 April.)

The first engagement of Mr. Cross and Mr. Spragg was to call on the Hon. S. M. Smith, Minister of Internal Affairs, at Parliament Buildings, which they did in company with Mr. Muston and Mr. Ian Calder [*A*], Chairman of the Wellington Branch of the New Zealand Institute of Architects. After a private talk with the Minister, who is concerned with proposals for amending the legislation dealing with the registration of architects in New Zealand, he gave morning tea and refreshments to a number of the leading architects in Wellington and the surrounding districts. The Minister welcomed Mr. Cross and Mr. Spragg in a gracious speech, to which Mr. Cross replied; and Mr. Muston thanked the Minister on behalf of the New Zealand Institute. Mr. Smith then showed the two visitors over the Parliament Buildings. After lunch, in company with Mr. Muston, Mr. Calder and Mr. F. E. Greenish [*A*], Hon. Secretary of N.Z.I.A., a call was made on the Mayor, Mr. F. J. Kitts, M.P., at the City Hall where, with members of the Executive Committee of N.Z.I.A., Mr. Cross and Mr. Spragg were given a warm welcome. Mr. Gordon Wilson [*A*], the Government Architect, then took the visitors—in company with Mr. Greenish and Mr. J. Dawson—to the top of Mount Victoria, from which they had superb views of the city, the harbour and the surrounding country. The next engagement was a cocktail party at the National Club, arranged by the Wellington Branch. It was attended by a large number of members of the Branch and their wives. Mr. Calder welcomed the guests and Mr. Cross gave a short address. Afterwards Mr. and Mrs. Muston gave a dinner to some thirty guests at their house in Lower Hutt.

27 April. The day started with a Press interview, then Mr. Cross and Mr. Spragg went with Mr. Muston and Mr. Greenish to meet the Mayor of Lower Hutt, Mr. Percy Dowse, at the fine new Town Hall and Municipal Offices, designed by Mr. Keith Cook, who was also present. The Mayor showed the visitors over the new library and little theatre for which Mr. Muston's firm, the Structon Group, were responsible. Also seen were one of the community centres and the new swimming-pool.

After lunch Mr. Cross and Mr. Spragg had a talk with Dr. Williams, Principal of Victoria College of the University of New Zealand, on the question of architectural education and the feasibility of setting up a School of Architecture in Wellington. Then the two visitors went to Lower Hutt to see the new church designed by Mr. Muston's firm, awarded the Gold Medal of the New Zealand Institute of Architects. The church was visited by the Queen and the Duke of Edinburgh during their visit to New Zealand. Then, in company with Mr. and Mrs. Muston, a call was made on the Rt. Hon. Walter Nash, Leader of the Opposition in the New Zealand Parliament, at his home in Lower Hutt. Mr. Nash spent the early years of his life in the Midlands before coming to New Zealand, and in the course of conversation it transpired that his first job, at the age of eleven, was with Mr. Cross's uncle, who was a solicitor in Kidderminster. *(To be continued.)*

Symposium on the Constructional Use of Timber

Held at the R.I.B.A. on 16 April 1957, Mr. Thomas Mitchell, M.B.E., B.Sc.[*A*] in the Chair

The Chairman: The title of the Symposium this evening has been made *constructional* use of timber, not structural use, so that we may cover non-load-bearing walls as well as structural walls. It is not intended to be a potted textbook served up in lecture form but a review of modern practice in this country, not abroad, since the war, of a nature to interest—as we think—the greatest number of architects. Therefore, it will be deficient in certain specialist aspects, as you will see.

We have five speakers who are arranged here on the platform in the order in which they will speak. Mr. R. M. Hemmings of Samuel Elliott and Sons (Reading) Limited belongs to one of the best-known joinery firms in this country. He has a special knowledge of laminated construction and prefabrication and he is to read a paper entitled 'Economics, with special reference to Lamination and Prefabrication'. Next we have Mr. J. C. Stillman who is to read a paper on 'Schools and other Buildings'. Mr. A. W. C. Barr, Assistant Housing Architect, London County Council, is to deal with 'Houses and Flats'. Mr. R. T. Walters will deal with 'Building Systems'. He is of the Eastern Region of British Railways. Finally, Mr. A. C. Oliver of the Timber Development Association will deal with 'External Finishes'.

R. M. HEMMINGS.

The Economics of Timber Construction in Building

THE PROBLEM of economy in the use of any material has always been part of the design for living and well-being. This small island of ours soon consumed its major natural store of timber, and owing to the lack of re-afforestation from the Middle Ages onward we have never made good the deficiency, the result today being that we have to import to the tune of over £140 million worth of softwood which approximates 1,690,000 standards, and about £31½ million worth of hardwood which approximates 54¼ million cu. ft. In addition to the hard and softwood imports, we also spend approximately £24 million a year on importation of plywood.

These astronomical figures take no account of the initial waste thrown up in producing the sawn timber as imported.

A figure of at least 50 per cent from standing timber until conversion is quite normal, to which must be added another 15–20 per cent waste accumulated during conversion into the finished product. Allowing for cutting back, it is quite easy to see that a wastage factor from the time of log falling to finished product can be anything between 75 and 100 per cent, which makes one appreciate that the greatest economy must be studied in design and in manufacture in order to make timber products comparable with other manufactured goods. It is necessary to appreciate that the displacement of other materials must be connected with relative costs of manufacturing in wood and also with an acceptable standard of finished product. We must also aim at a design that is not a substitution or one based on expediency, but rather a structure having a high aesthetic appeal as well as being economical.

Assuming that one can predetermine the size, shape and price of the finished article there is one great disadvantage which the timber engineer has to overcome, and which in the case of steel can be controlled during manufacture, and that is that the designer must recognise that wood is a natural product subject to a wide variation in quality, colour and durability. There are many variations not only within a species but also within a tree. Consequently, because of incalculable defects, it is exceedingly difficult to give any exact strength tables for calculation purposes. The design of timber structures has not followed the pace set by the research and design in concrete or steel. This, no doubt, is partly owing to the lack of knowledge both in designing and manufacturing stages. So far the result has been rather disappointing and has produced inferior designs and workmanship. In this country we are again beginning to appreciate the qualities of timber, its mouldability, its strength and weakness, its living character and how to control its movement.

A structural engineer would naturally regard material with suspicion if he is unable to predict its behaviour under known conditions, but as timber varies with its environment this in turn brings about variations in weight, hardness, width of growth rings, colour, grain, figure, knots and texture. The safeguard must necessarily be selection, selection to a stage of stress grading by trained technicians with an intimate knowledge of timber, its cellular construction, behaviour under varying conditions, its ability to withstand sudden shocks, strains, compression loads and also when in tension and shear. At the same time the inherent weakness of the lower grades of timber must be recognised and safeguards taken to eliminate the possibility of failure when in use as a constructional member. There are various Codes of Practice which establish minimum requirements, but these should be used with discretion and a certain amount of reserve. Stress grading is becoming more and more an essential part of timber engineering so that its sensible application is bound to help economy and at the same time widen the field of application.

Economy is influenced to a considerable degree by collaboration in the earliest possible stages of a design. Some reference to this was made at the last Symposium where specialists were called in during the planning stages and were paid a fee for their services. At the same time they were still allowed to tender for the work at a later stage. This is a very fair way of effecting economy providing the manufacturer is willing and able to divert staff for this purpose.

Generally speaking most manufacturers are only too delighted to assist in any development, as, by the continuous effort of attaining the ideal, progress is considerably assisted.

There is one factor dealing with selection of manufacturers for tendering purposes, and that is to select the number of firms so that the groups are comparable in their various fields of activities. There is such a big difference in standards of finish and material that the architect requires to know his manufacturer fairly intimately when deciding which group to select. This happy relationship has existed in this country for many years with a considerable saving to the client, but there is one further point which needs amplification and that relates to keeping within the limits when detailing standard articles which are manufactured in bulk. Deviation from a standard product, whilst possibly desirable from an aesthetic point of view, does increase the cost of production at a greater expense than the end product warrants. The value of repetition is not always appreciated, nor yet is it desirable, but as a guide it is possible to achieve a saving of 5–10 per cent when dealing with repetitive articles during the manufacturing stages. Once the jigs and tooling-up has been carried out, the cost per article should be reduced considerably giving the benefit to the client.

In this country we are by nature very conservative as regards the wider use of timber structures. This conservatism is reflected in our Codes of Practice which detail a limit of 1,200 lb.f (flexure) for European Redwood, whereas the American timber engineers are able to work at 2,500 lb. per sq. in. in Standard Douglas Fir.

Running parallel with the exploitation of timber as a constructional medium there has been a wonderful development in the manufacture of plywood and adhesives. Again covered by various Codes of Practice and recommendations which are now becoming world-wide, it ensures that it is possible to use plywood of a given standard which will not de-laminate under any time of exposure. The Canadians have gone a long way in ensuring the manufacturing standards of plywood together with the controlled manufacture and application of adhesives, and the Douglas Fir Plywood Association are to be commended on the voluntary Standard for which they are responsible in the trade in Canada. This means that it is only necessary for the purchaser to specify his needs from nationally accepted grading Standards.

Adhesives used in laminated products

either for plywood or glued laminated members usually conform to the following groups: (1) Casein, (2) Urea Resin, (3) Resorcinol resin, (4) Phenolic resin.

The first, Casein, is undoubtedly the most economical but its field of use must be restricted to internal purposes or where protection can be applied against inclement weather and high humidity.

Urea Formaldehyde resin has the advantage over Casein because the setting time can be accelerated by the application of heat which in turn increases production by releasing jigs and cramps.

The Resorcinol group are of course the most expensive to produce but have the great advantage of being impervious to all classes of weather, water or extremely high humidities. The designer should therefore consider these four adhesives and their application when incorporating them in his timber structure. As a guide in design for assembled structures the thermo-setting adhesives should only be specified where controlled temperature conditions are available. This does limit the field of application when incorporating them, in that fabricated structures tend to be regarded as a workshop prerogative leaving timber structures of the connector type to be fabricated on the site. The Americans have introduced steam curing under open tarpaulins for accelerating the setting, which has resulted in large laminated arches being manufactured in situ but at the same time under controlled conditions.

Modern construction in timber engineering products can be applied to trusses, beams, girders, columns, rigid frames or arches. Any of these products can be woven into the design of domestic houses, churches, schools, industrial plants, warehouses or commercial buildings, thus combining strength and architectural detail with economical structures.

Maintenance costs are considerably reduced, and, because heavy timber structures are resistant to destruction by fire because of their natural insulating properties, favourable insurance rates can be obtained. Douglas Fir chars slowly when attacked by fire, approximately 1 in. in 33 minutes. Glued laminated wood structures are also slow to burn and do not quickly lose their strength under high temperatures. This gives certain advantages over structures of non-combustible materials. Adhesives are also resistant to fire so that there is no breakdown or deterioration of the glue line taking place during fire exposure.

Laminated glued members are stronger than other structural members of equal weight and lighter than other members of equal strength. In addition, where the structures are manufactured with waterproof phenol-resin the laminae may be given any desired preservation treatment either before or after lamination. This again reduces maintenance charges at a later stage.

Because of the greater strength of seasoned timber and the confining of knots to each separate lamina, a glued laminated member is approximately one-sixth stronger than a sawn timber member of equal section. It is thus possible to reduce the sectional area without loss of strength. The only disadvantage being, of course, the increased labour content caused by the preparation and actual gluing together with the subsequent cleaning-off operation if the members are exposed. Against these costs, however, must be offset the greater permissible flexural stress and the increase in the modulus of elasticity.

The economy of maintenance is not thoroughly appreciated at the designing stage, the attitude being that in some cases it is more economical to save on the initial cost, leaving the owner subsequently to face up to maintenance charges at a later stage. This attitude appears to be very prevalent in school design work, owing to the necessity of confining global expenditure at the initial onset to a given quota per child place. Local authorities in years to come will have to face this short-sighted policy or else the buildings of today are going to deteriorate rapidly and lose the aesthetic appeal which is produced by the use of colour as against the mellowing effect produced by age on brick and stone. Timber structures must be adequately protected against the weather and also the deposit of grime and soot if they are to retain their initial outstanding appearance. These remarks also apply to delivery to the site where erection is the concern of another contractor. There is a very great need for the building industry to recognise the existence and to treat with greater care the differing manufactured articles which go towards making a complete building. It is very disastrous on occasions to see the damage being done by wilful neglect and lack of protection before the completed building is handed over. Greater care by everyone would produce a finer finished job. We must also realise the tremendous effect, and possible reduction in cost, of modular co-ordination, and the sooner the designer appreciates the flexibility that can be obtained within the framework of co-ordination the quicker timber structures will take their place in the ordered sequence of design.

Dealing with the erection of fabricated wood structures and more especially with single-storey buildings, there has been concrete evidence provided during the last two to three years. The general contractors are favourably impressed with the ease and speed of erection as most of the joints have already been drilled in the workshop leaving the site erectors the connecting bolts to deal with. An average 40 ft. stressed skin main beam weighs 6–7 cwt. depending, of course, upon its function, and this is easily handled with ordinary contractor's plant. As soon as the main and secondary beams are in position, the roof decking can be laid, which in turn produces a covered area for storage of other materials, and in effect gives an umbrella over the site at a very early stage in the general progress. Much of the erection can be undertaken by semi-skilled or unskilled labour, and the contractor has the advantage of being able to work his partitions, main wall cladding and interior finishings within predetermined limits. This is more noticeable when the whole scheme is designed on a grid of 3 ft. 4 in. or a similar dimension.

The same remarks apply to laminated arches where the main connections are at the apex and to the shoes at the floor level. Once the arches have been erected the purlins and roof covering can follow very quickly giving an immediate covered-in area for the following trades.

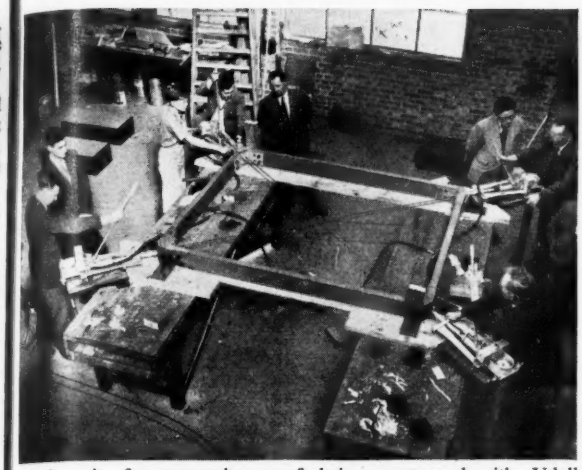
Another advantage of wood structures is the elimination of wet trades. There is very little waiting time involved on the finishings of inner surfaces by using either plywood, hardboard or plasterboard, with, of course, the insulating material or blanket interspersed between the inner and outer surfaces.

These conclusions have not been reached without a certain amount of trial and error, but the comparison would not be complete without some reference to transport costs which again have proved very favourable in dealing with wood structures. The whole problem of infills between wood stanchions, such as windows and shiplap boarding, is outside the scope of this paper, but it would not be out of place to mention one particular problem which needs very careful handling and that relates to the use of boards exceeding 4 in. in width, whether laid vertically or horizontally. There are, of course, a number of timbers which are known to have excessive shrinkage and swelling properties, and it is advisable to obviate the use of these boards, or, if this is not possible, then the widths of the boards should be kept to a size not exceeding 3 in. and so reduce the amount of shrinkage and swelling that can take place in large areas of surfaces that are clad with boarding. If possible, the widths should be restricted to 3 in. which is obtained by edging off 3 in. planking rather than by taking the normal flat sawn boarding. The only disadvantage of using narrow boards is the fact that there is additional handling to be considered when fixing the boards to the framing.

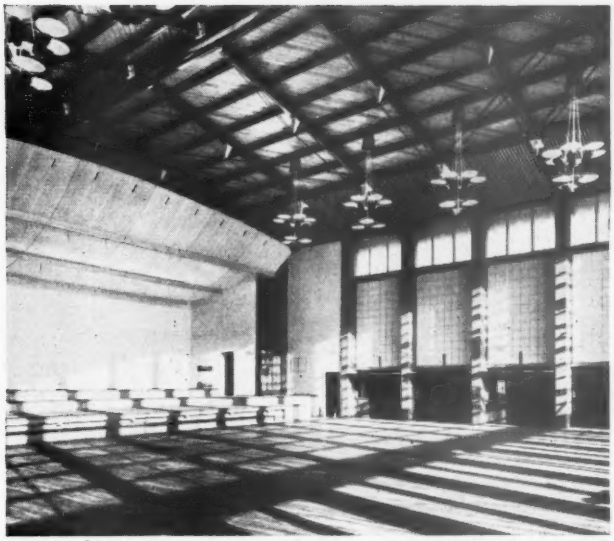
A further point which relates to design, especially with the present-day tendency for cross-wall construction, is to limit the widths of panels and windows so as not to exceed 20 ft. This is on account of handling both in the shop, transport and on the site. An alternative suggestion, of course, is to use the split mullion, which also includes making heading joints between the various horizontal members. These joints could cost anything up to 20s. per member if made with handrail bolts and wood dowels, and if there are four or five horizontal members included in each particular panel the overall cost is sufficiently increased to reduce the margin between wood and metal windows or wall panelling.

Let us candidly admit that we are only just beginning dimly to apprehend the lengths to which technical development can go, and the tremendous momentum which will develop within the next ten years.

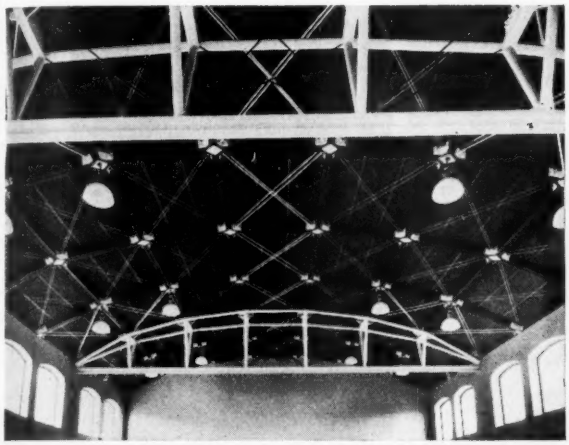
Mr. Hemmings showed a number of slides some of which are illustrated on the facing page.



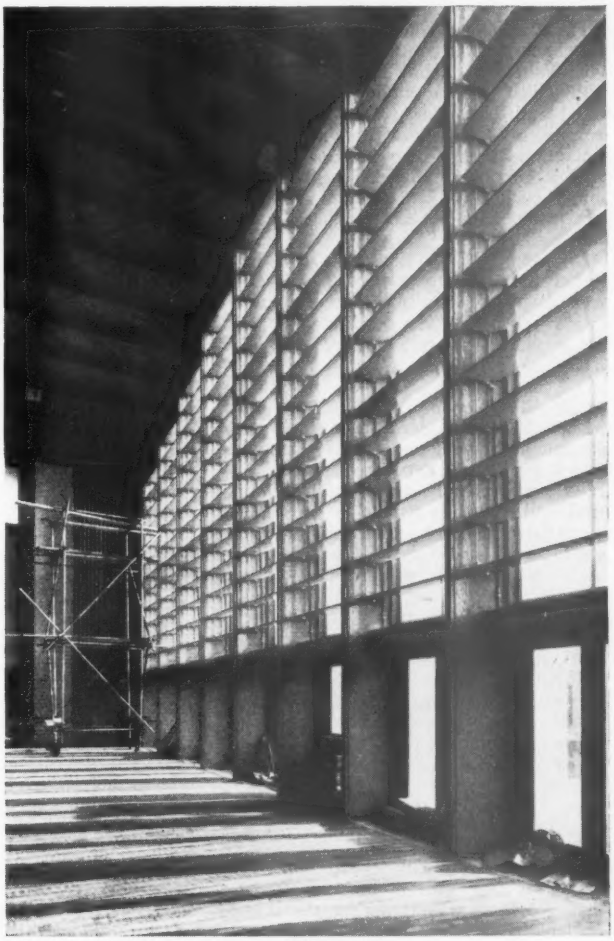
Sapele units for gymnasium roof being prestressed with Udall Gifford hydraulic jacks



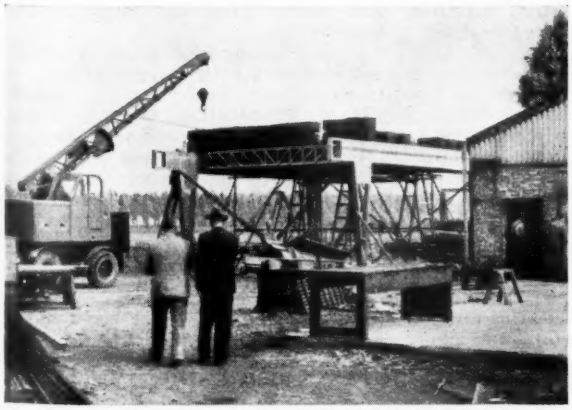
Sapele roof timbers, with stressed skin acoustic reflector in veneered Sycamore



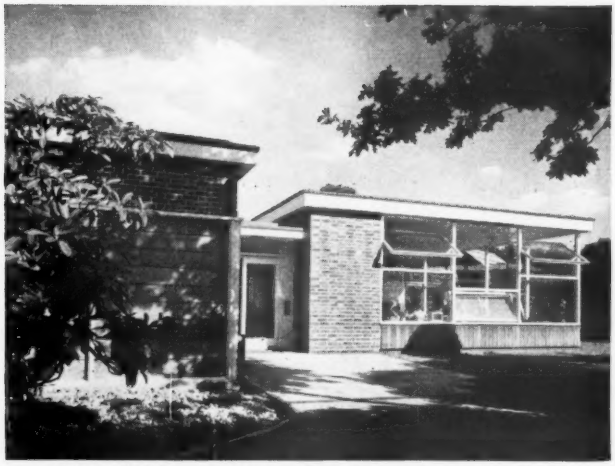
The complete assembled gymnasium roof, new L.C.C. school at Hammersmith



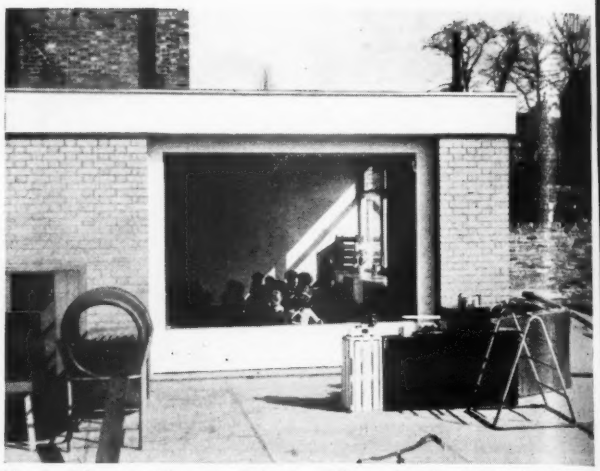
Solar-acoustic reflectors in veneered Sycamore



Testing portal frame stressed skin pavilion. This is the prototype of many of the Herts County Council timber frame schools



East Grinstead School. Architect: Hilton Wright [*A*]



North Islington Nursery School, sliding glazed door. Architects: Stillman and Eastwick-Field [*AA*]

JOHN STILLMAN [*A*]

Timber in Schools and Other Buildings

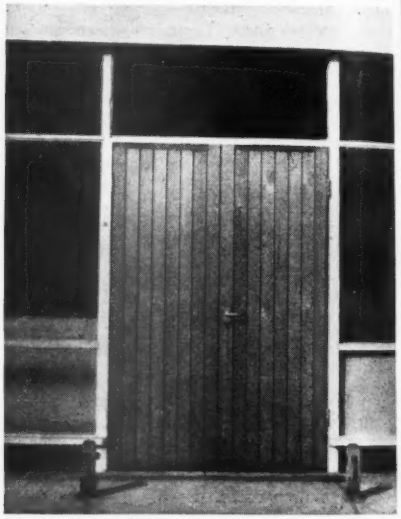
MY CONTRIBUTION tonight is concerned with the factors which make architects decide to use timber in the construction of schools. Mr. Walters is dealing later with systems with which one can build entire schools, and I find that (apart from joinery which we are not dealing with) the principal remaining uses are in *roof construction* and *windows of various kinds*. These are not of course exclusive to schools so I have therefore included references to other types of building.

My approach is that of a practising architect, not a timber specialist or engineer. I have tried to bring my own knowledge up-to-date, and would like to thank the architects and manufacturers who were kind enough to help me.

Traditional Uses of Timber. The introduction and development of steel and concrete in the last hundred years or so has been largely at the expense of timber. The traditional uses in the construction of floors, roofs and staircases remain in houses, but in schools and other larger buildings there is quite a short list of uses which are so established as not to be questioned: joinery, including doors, gymnasium and other floors, handrails, fixing blocks, battens and framing.

The architects of the first modern schools, built two or three years before the war, had I think a preference for such things as trusses and glazing bars to be of a lighter appearance than is usually possible with timber. They thought in terms of the 'modern' materials—steel, concrete and glass. Timber, though it was cheap and plentiful, was kept out of sight. There was perhaps a prejudice against timber because of its association with cheap temporary schools of poor appearance built after the First World War and during the slump. Incidentally, I know of a girls' grammar school built in temporary timber huts, some dating from 1914, which is still in use.

North Islington Nursery School, view through open sliding door into courtyard



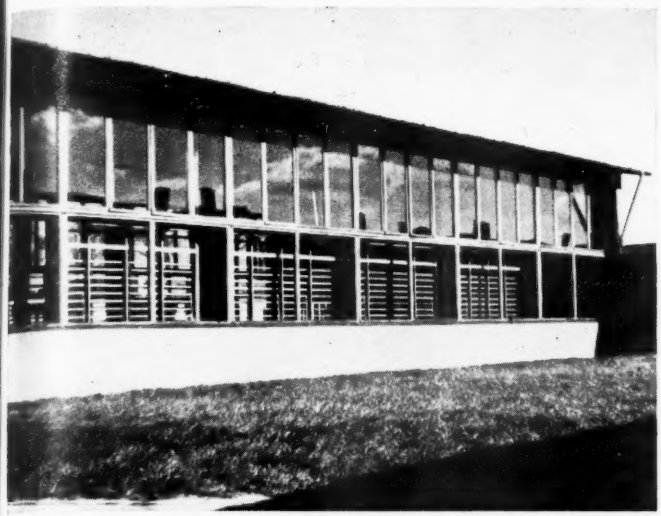
The same school, detail of Western Red Cedar doors

Timber as a New Material. Since timber became freely available again only a few years ago, after years of acute shortage, efforts have been made to reintroduce it, one might almost say as a *new* material. Success has been encouraged by the following four factors:

1. *New Techniques for Design and Fabrication.* Timber can now be considered an engineering material: British Standards for stress grading are established, and there is a Code of Practice for design. This advance is the result of two things: (*a*) the invention of timber connectors—an economic method of making very strong joints between light timber members; and (*b*) the development of durable synthetic resin glues which comply with stringent tests of B.S. 1204 and permit glued and laminated construction.

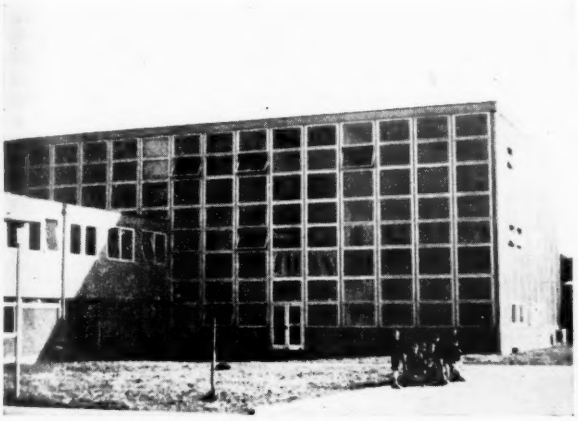
It is a fundamental axiom of modern architecture that new techniques should be investigated and exploited. Encouraged by pictures of timber used excitingly abroad, principally in the softwood producing countries of North America and Scandinavia, and by the Timber Development Association at home, the more adventurous architects and engineers have tried their hand at it.

2. *Good Appearance.* Timber is a beautiful material: it has friendly, sympathetic qualities in both structure and cladding. I expect you will all have admired, in the exhibition upstairs, the way it has been used by the Finns. Alvar Aalto said last week: 'wood gives free forms—which are a symbol of freedom'. Its appearance is, of course, quite different from other materials

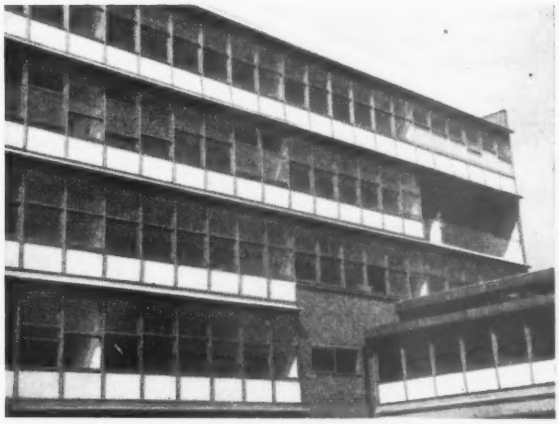


Headstone Lane Secondary School gymnasium. Architects: Stillman and Eastwick-Field [*AA*]

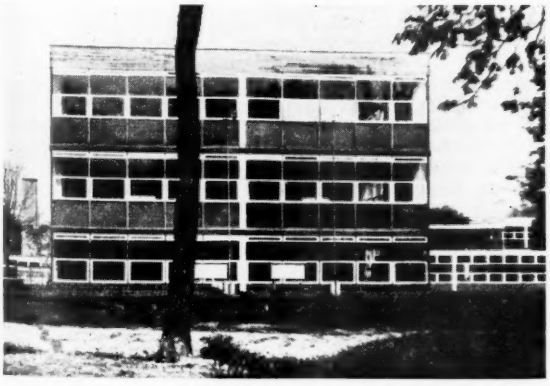
Staveley Road Secondary School gymnasium. Architects: Stillman and Eastwick-Field



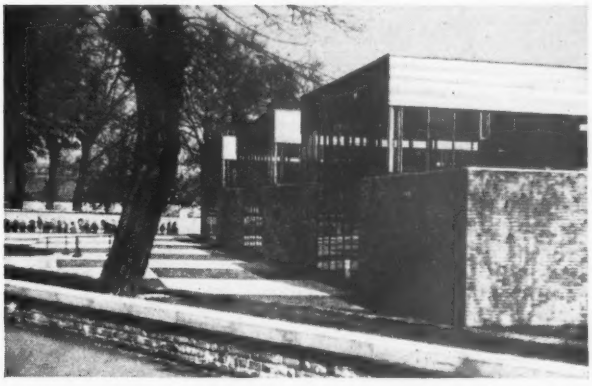
Staveley Road Secondary School classroom block



Quintin School. Architect: Edward D. Mills [*F*]



Mayfield School classrooms. Architects: Powell and Moya [*FF*]



Mayfield School gymnasia

and requires a different aesthetic. I am sure there are opportunities for imaginative design using the new techniques even within the close limits of cost most of us have to work to.

3. *Plentiful Supply of Timber compared with a Shortage of Steel.* One must confess that during the last few years this has been, more often than not, the reason for turning again to timber. One of our few joys has been the plentiful supply of relatively cheap African hardwoods. Now softwoods are plentiful again if not as yet including the first grade material which was enjoyed before the war.

4. *Lower Cost.* In many circumstances straightforward designs in timber are cheaper than if they were in other materials. For instance bolted connectored roof trusses over about 50 ft. span are cheaper than the same thing in steel.

More interesting and complicated structures, on the other hand, are likely to be more expensive unless there is considerable repetition. Windows and curtain walling are similarly cheaper in timber than in steel.

Examples of Comparative Costs of Roof Beams and Trusses.

50 *ft. span*

T.D.A. bolted or bowstring truss: £60	steel truss: £90

40 *ft. span*

Laminated timber portal frame: £100	steel portal frame: £75

38 *ft. span*

Timber glued laminated beams: £100	painted steel RSJ: £50

Delivery

Timber: 6–8 weeks	steel: 3–6 months

Since timber has such attractions one must explain why it is not used more freely. No doubt the chief reason is that in this country the modern techniques of design and construction are still very new. Only a few years ago, for instance, one could not find more than one or two firms prepared to make laminated arches—and these were very expensive. One must recognise too that with any new development architects must at first be prepared to do more work and take more risks than with established practice.

There are however two more fundamental disadvantages to timber which I feel I must mention: the danger of fire and its susceptibility to decay.

Fire. Structural timber (that is members more than about 2 in. thick) burns quite slowly, and does not lose strength with the rise in temperature alone as metals do. This should be contrasted with the ease with which thin timber will catch fire. It may be argued therefore that exposed trusses are better, as regards fire, in timber than in steel or aluminium, though timber or fibre board linings are a considerable danger.

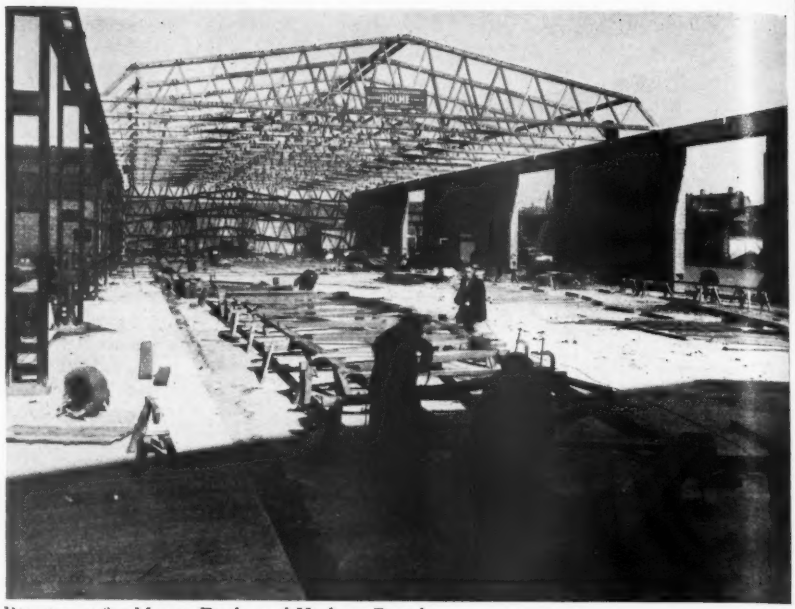
Mr. Barr will describe later the fire regulations incorporated in building bye-laws. Since schools are exempt from bye-laws, County Councils usually take the advice of their own fire officers, but they are now helped by Bulletin No. 7 issued by the Ministry of Education which gives recommendations for construction and means of escape. Briefly, these recommendations permit constructional timber to be used:

(*a*) in roofs;
(*b*) in floors and internal walls and partitions in buildings up to four storeys high;
(*c*) throughout single-storey structures. Its use throughout buildings of more than one storey might be permissible if the increased hazard implicit in its use is counterbalanced by precautions that are additional to or of a higher standard than those recommended in this Bulletin.

The recommendations concerning linings generally require materials of low flame spread. Thus solid timber, plywood or hardboard which at best are Class 3, may only be used in some parts of single-storey buildings, or on ceilings where certain other conditions are met.

Danger of Decay. There is always some danger of attack from fungus or beetles. Ideally woods should be used which are naturally resistant to decay (e.g. Western Red Cedar, Iroko or Teak) or woods which have been impregnated with chemical preservative, and only certain woods are suitable for this treatment. Impregnation adds about 10 per cent to the cost of the wood. A brush application is of course cheaper but it is not considered to be a permanent treatment.

Under certain circumstances it may be considered that the risk of decay is so small that the choice of resistant woods which may have other disadvantages or preservative treatment is not justified. For instance, roof trusses exposed inside a heated building are unlikely to suffer from dry-rot, which only attacks damp wood. Equally there may be little danger of insect attack. The risk of this varies from place to place and with the type and condition of the wood. Broadly speaking the lyctus beetle only attacks the sapwood of certain hardwoods, the death-watch lives on old oak, and only the furniture beetle is likely to infect structural timbers. This goes for the sapwood of softwoods and hardwoods alike, but not until the wood is 20 years old or so.



Warehouse for Mersey Docks and Harbour Board

In conclusion, and before I show my slides, I should like to say it is my view that we have reached the end of a period of experiment. Research and development is, of course, still very necessary but enough work has been done to prove the value of the types of design I have described.

Today architects are being asked to offset the continuously rising costs of labour and materials with more economic designs. If full-scale prefabrication of buildings has not yet, with its high factory overheads, been able to compete with more traditional building because of cheaper site labour, I believe the prefabrication of large components such as floor and storey high panels may be a necessary intermediate stage. For this, timber has great advantages: there is an established joinery industry well equipped with machine tools for quick production of large as well as small components. Timber is an ideal material for prefabrication—light in weight for transport, does not crack or break in handling, and can be adjusted and fixed easily on site.

The trade is now setting itself out to give a service of design and production similar to that given by the steel trade. My guess is that architects will not be slow to take advantage of this service.

A. W. CLEEVE BARR [*A*]

Timber in Housing

IN THIS SHORT PAPER I have to consider the the use of timber in Great Britain in individual houses, in terrace housing and in multi-storey flats. Other than in the specialist systems, which Mr. Walters will describe later, there have been few recent developments in floor or roof construction. We should note however, in passing, the virtual disappearance of the traditional timber joisted ground floor, and its replacement by the concrete site slab, which is cheaper, warmer, and less likely to give maintenance trouble. We may also note the widespread adoption of T.D.A. roof trusses—not because they are more economical, either in cost or in timber content, than the traditional purlin roof, which is in fact doubtful, but because they give greater freedom in planning.

Most of the information which I have been able to piece together relates to the use of timber in walls. Here again, outside the specialist systems, there is little new—particularly when one remembers for a moment the fine tradition of weather-boarded houses and mills of south-east England in the 18th and 19th centuries. There is, however, a considerable revival of interest in timber for housing today, partly because of its intrinsic aesthetic values, partly because of its suitability for prefabrication and rapid erection, partly on account of intensive advertising campaigns by the big timber producers.

Before showing my slides I would like to make a few general comments on bye-law and fire requirements.

Outside London, the Model By-laws, 1953, provide that the external walls of small houses which are not less than 10 ft. from the site boundary do not need to conform to any particular requirements either as to combustibility or as to fire resistance. There is in fact no bye-law restriction against the use of timber, softwood or hardwood, for the structure or cladding of a small house, not less than 10 ft. from the boundary.

In the case of terrace houses the same conditions apply, but every alternate party wall is required to project 9 in. beyond the face of the external timber wall *and above the roof*. The latter requirement is fortunately not always observed in practice and is generally regarded as obsolete.

In the case of multi-storey flats or maisonettes the Model By-laws require that the external walls shall be non-combustible throughout and shall have a fire-resistance of one hour. The fire-resistance is not difficult to achieve but the non-combustibility requirement, if insisted on, would of course exclude timber. In fact relaxations in this respect have been granted by several local authorities, and there are a number of examples of multi-storey housing with timber cladding under window panels in flats and maisonettes. The Fire Research Station, I understand, are about to embark on a series of tests to ascertain the effect on the spread of fire, of openings in external walls, and of combustible claddings. It may well be that these will show that the bye-law requirements have been excessively cautious—but we shall see.

Fig 1: L.C.C. timber-framed houses at Burnt Oak

In London the County Council By-laws, 1952, also require that external walls shall be constructed of incombustible materials. Waivers have however been granted, subject to certain fire-resistance requirements according to height, for timber cladding on domestic buildings up to three storeys, and timber facings have been permitted, for example on the back wall of private balconies though not on a sheer face, for taller buildings.

Given compliance with building bye-laws for the construction of chimney flues and so on, there is no more danger from fire for the occupants of a timber-framed house than for those of a brick structure with timber floors and roof. It must be admitted, however, that should a serious fire develop, the property itself is more likely to be a complete write-off than is the case with a brick house. For this reason fire insurance premiums on an all-timber house are likely to be sixpence or a shilling higher than on a traditional house. Given a timber structure and brick-veneer external walls no extra premium is charged.

My first illustration (Fig. 1) is of timber-framed houses built by the L.C.C. at the Watling Estate, Burnt Oak, in 1926–27. Some hundreds of these houses were built during this period at various estates in the London area. They have stud walls, softwood weatherboarding and fibre-board linings. They look extraordinarily well. The creosoting is only re-done once every five years, with the normal external painting, and the maintenance in turn has been no greater than with a brick house. For reasons of reducing fire spread, terraces of timber-clad houses were alternated with brick terraces. Note how much better they look without the 9 in. projection of alternate party walls.

At the same date Liverpool Corporation built several hundred similar houses, but faced them externally with a 4½ in. non-structural brick skin. These also, I am told by the Corporation, have given no particular maintenance problems.

On a visit to Canada, which I made some twelve months ago, to study timber houses, I was surprised to find that the idea of facing timber-framed houses with a veneer or skin of brickwork is popular, particularly in Ottawa, at the moment, where a house owner—once the frame is up and sheathed and the heating on—will often move in before the brick veneer is added. Architecturally, I find the idea unpalatable, but one must admit that it does retain some of the advantages of timber construction and meets the bye-law and insurance requirements more easily.

In these Scottwood houses, of which some thousands were built, the external walls were large factory-made units, storey-height by house width, consisting of two skins of resin-bonded ply, glued to studs, with the cavities filled with glass-fibre insulation. The floors were also prefabricated in large units with thick plywood flooring. Technically the system was extremely interesting but unfortunately not competitive in price with traditional methods.

The L.C.C. is at the moment considering a number of alternative designs for terrace houses, using timber-framed and weather-boarded external wall panels on sites outside the County boundary. The external walls carry the roof, and they, as well as the interior load-bearing and non-load-bearing partitions, are stud-framed. Party walls are brick.

In this example, the low-pitched roof consists of simple rafters spanning from the head of the external wall panels to the

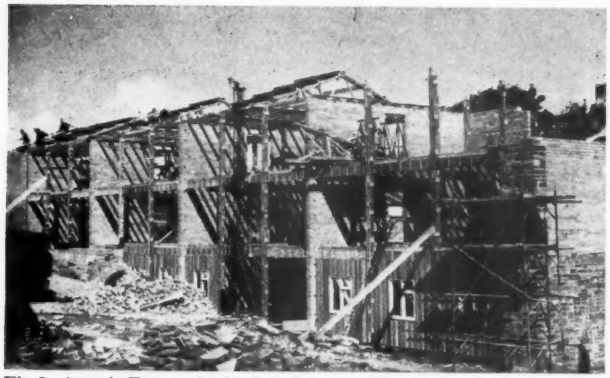


Fig 2: Atomic Energy Authority's hostel at Thurso

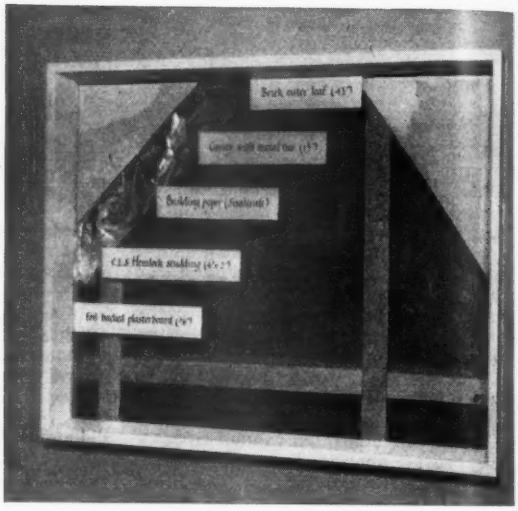


Fig 3: Canadian Trend House exhibit at the Ideal Home Exhibition

Fig 4: Progress photo and group of Spooner houses

ridge-piece. Instead of projecting 9 in., the ends of the cross-walls are returned in the form of 2 ft. 3 in. wide cavity-piers, almost flush with the timber external wall panels. As these schemes are still only in working-drawing stage I do not propose to discuss them at length, but one hopes that they will be rapid to erect, and that they will show economies—in foundations as well as in superstructure—particularly in areas where building labour would normally have to be imported.

An extreme case demonstrating the value of timber construction in areas where adequate building labour is not available is the Atomic Energy Authority's three-storey hostel at Thurso at the northern tip of Scotland (Fig. 2). The plan contains mainly bedrooms each about 10 ft. square, with a central corridor on each floor. There is a large dining hall, with bedrooms over, in the link block connecting with a large existing house. The structure consists of laminated timber box beams at 10 ft. centres, bolted to and passing between twin timber columns. The main roof trusses, at the same centres, also bolt to

these columns. Floors are of normal timber joist construction. All partitions consist of stud frames, with plaster-board linings. External walls are also stud frames with cedar-boarding, insulating quilt and plaster-board linings—U-value ·15. All structural timbers, floors and partitions are pressure-impregnated with fire-proofing and preservative processes. Note the fire-check brick walls at about 30ft. centres.

This hostel was designed, manufactured and erected by Messrs. W. J. Simms, Sons and Cooke Ltd. working in collaboration with the U.K. Atomic Energy Authority Industrial Group, H.Q., Risley. The contract was placed on 1 June 1956. The building was completed and handed over for occupation within six months from that date.

This picture (Fig. 3) shows the so-called Canadian Trend House designed by Wells and Hickman and recently exhibited at the Ideal Home Exhibition. The structure consists entirely of timber stud walls, including the inner skin of the gable walls which externally are simply a brick veneer.

You will have noticed three different finishes on the exterior of the house—cedar-boarding, rendering below the windows and brick on the gable walls.

This cut-a-way panel shows the cedar-boarding laid over building paper on plywood sheathing over the studs, with aluminium-foil backed plaster board as the inner lining. The next shows the brick wall behind which is a 1 in. cavity and building paper over the studs with the same inner lining. Galvanised cavity wall ties, nailed to the studs, are built into the brickwork. The U-values are ·23 and ·20 respectively.

Here I must comment on the question of vapour barriers. In Canada and the States great attention is given to obtaining a complete vapour seal around the inside periphery of a timber building—walls and ceilings. Glass or mineral fibre insulation bats are fixed between the studs, with a bitumen-coated paper backing which is overlapped and stapled together over the studs from the inside. In addition 2 mm. thick polythene lining sheets are often stapled to the studs on the inside before the plaster board is fixed. The purpose is to avoid condensation occurring within the cavity. In the far less severe climatic conditions in Britain aluminium-foil backed plaster board probably provides adequate seal and also a useful degree of thermal insulation.

From the point of view of avoiding damp in the wall cavities the important thing is to have an external lining—bitumen felt or paper or what you will—which breathes, and which does not trap condensation escaping from inside within the wall. If ply is used as an external lining Canadian regulations require that it shall be pierced to provide ventilation to the cavity.

An interesting but curiously mixed method of construction which has been successfully applied to both houses and flats is that developed by Mr. Chick of Highworth Processes, Ltd. This slide shows the application of the method to a house at

Fig 5: Maisonettes at Bristol. J. Nelson Meredith [*F*], City Architect

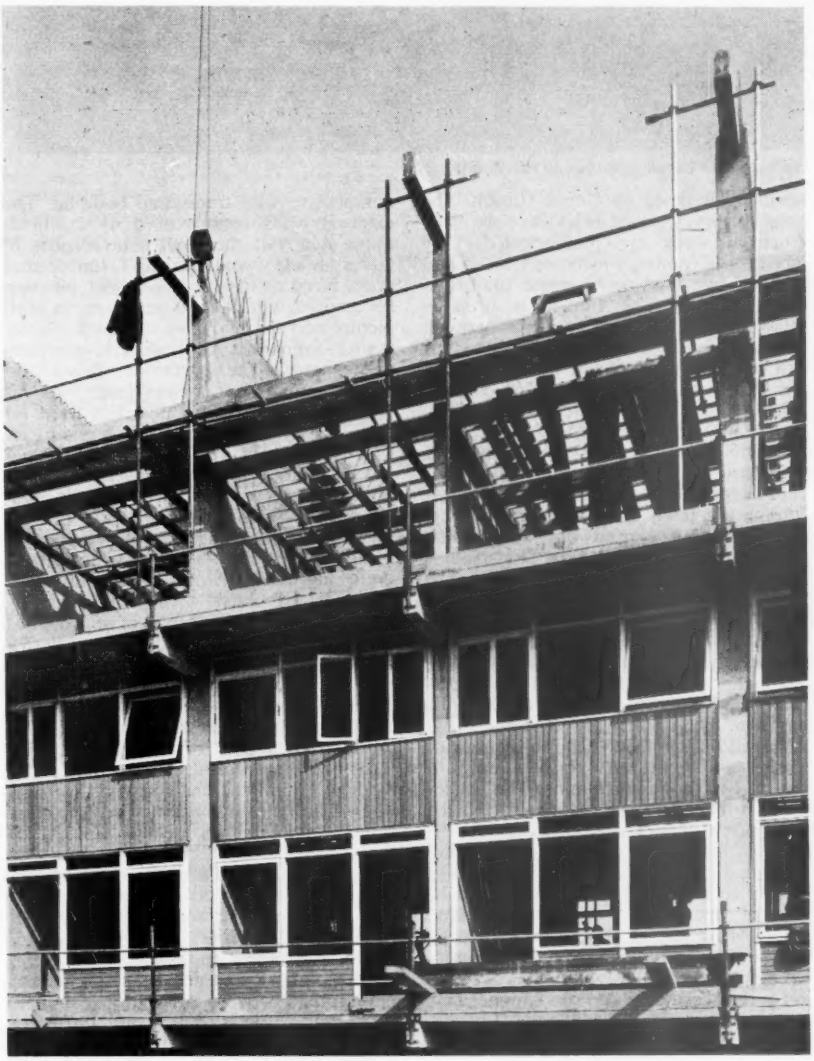


Fig 6: L.C.C. Housing scheme, Picton Street

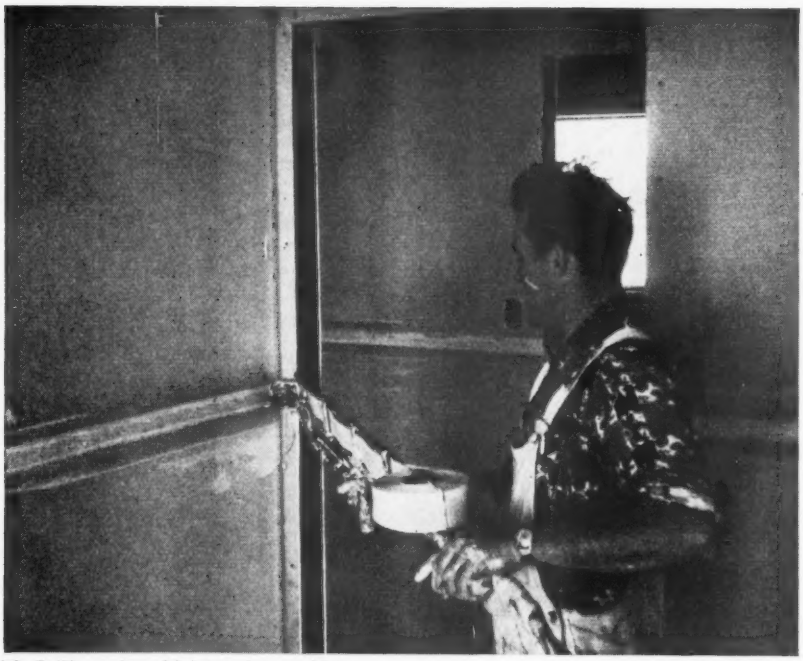


Fig 7: Plaster board joint-taping machine

Stratford designed by Denys Hinton. The structural walls are of brick, but the non-structural walls are prefabricated, very light timber frames, which are erected and plumbed first, and up to which the brick-work is built. The timber is pressure impregnated and the panels between windows are formed by covering the studs with felt externally, and then cladding both sides with 1 in. wood wool slabs, over which continuous strands of 12 s.w.g. galvanised wire are passed, and then strained, by driving in metal lugs at each end and tensioning the wires with clips. The wood wool is rendered.

Some extremely interesting experiments are now being carried out on housing estates at Coventry and at Dunstable—of which I have slides only of details. The external walls of these houses are of hollow clinker blocks rendered—architecturally they are of no great interest—but the whole of the interior walls, floors and ceilings are prefabricated in timber-framed panels, easily handled by one or two men. The timber is thicknessed—that is, planed on two faces—and in the case of ceilings and partitions consists only of 2 in. × 1 in. nominal framing. The plaster board is fixed before erection, and left for decoration with no skim coat. A good standard of finish, with little damage during erection, has been achieved. The method appears to be first-class from the point of view of speed and erection technique but unfortunately it requires a very large programme of houses to make it economic.

A somewhat similar method of construction is that developed by Mr. Spooner and extensively used in the Midlands (Fig. 4). This method is, in fact, based on a very large production programme and is highly competitive with traditional building. The external walls consist of a 4½ in. brick outer skin, but the inner skin consists of factory-made load-bearing timber-stud units, faced on the cavity side with bitumen fibre-board which you can see in this picture and on the room side with plaster board, skimmed. All timber is pressure-impregnated. The partitions, floors and ceiling units are factory-made, as at Dunstable, but plaster board is fixed on site. The party walls constitute a real break with tradition in that they consist of two sets of timber-framed units with a 4 in. cavity between, which is subsequently filled solid with concrete. The timber-framed units are lined on the cavity side with bitumen fibre-board, as permanent shuttering, and on the room side with plaster board.

In this eight-storey block of maisonettes at Jacobs Wells Road, Bristol, (Fig. 5), the City Architect, Mr. Nelson Meredith has used timber-framed external wall panels throughout both elevations with the exception of the access gallery level. The panels have wrot hardwood frames, with cedar-boarding backed with building paper fixed to 3 in. × 2 in. softwood vertical studs. The studs are lined with fibre-glass quilt, behind which is a cavity and a 2 in. clinker block inner lining. This must be the first block of flats of this height in Britain with timber cladding at each floor level on a sheer face, and, from the bye-law point of view, it sets a most interesting precedent. Note the 3 ft. wide concrete piers, which have been provided to limit horizontal flame spread between adjacent dwellings.

The next photo is of the London County Council's Picton Street Housing Scheme (Fig. 6). In this development of eleven and four-storey maisonette blocks, with some terraces of houses, all the cross-walls—that is the party walls—are of in situ concrete, the party floors are of precast concrete, but the intermediate floors, the partitions and the external panel walls are all of prefabricated timber-framed units.

The floors were prefabricated on site so that they could be handled and placed by the tower crane. A slight saving in timber content was made by spacing the main joists at 2 ft. centres, and fixing the boards to cross-bearers notched into the top of the joists.

The partitions consist of stud-frames lined with ½ in. plaster board.

In the tall blocks the external wall panels are frames of 3 in. × 1¼ in. studs faced externally with 1 in. nominal Brunei teak shiplap weather-boarding, and internally with aluminium-foil backed plaster board over fibre glass quilt. In the lower blocks the timber panels are faced externally with pylumenised ribbed aluminium sheeting over ⅜ in. asbestolux, and internally also with ½ in. foil-backed plaster board.

The scheme is being built as an experimental project under Part IV of the London Building Act and the combustible wall facing was permitted on the tall blocks because on both sides of the building every dwelling was protected from the spread of fire from the dwelling below by the concrete balcony floors which project 4 ft. from the wall face. Timber boarding could not be used on the lower blocks because the external walls were sheer faces.

Both these forms of external wall panel are competitive in cost with the traditional cavity brick wall, taking into account the structural savings involved, and they have greatly facilitated the rapid erection and enclosure of the blocks. The U-values are very good indeed, at ·12, and it is one of the great advantages of a stud-framed external panel wall that excellent thermal insulation can be obtained inherently in the form of construction at no extra cost.

My last slide is a rather obscure but fascinating picture taken by William Tatton Brown recently in the U.S.A. of a workman with a plaster board joint-taping machine (Fig. 7), which I myself saw being used extensively in Canada a year ago. This machine squirts a filler into the joint between the plaster boards and at the same time seals the joint with a tape. The joint is then finished and feathered off each side by hand. Even in low-cost speculative housing the joint does not show—you note the boards are laid horizontally—and the standard of finish is first-class.

Timber lends itself to dry-wall construction. It seems to me essential and logical that this should be followed by a technique of dry-wall finishing. In America they have perfected this technique. It obviates the need for a skim coat and for all the mess and delay which normal plastering entails. I believe that some such system must be developed over here, if full advantage is to be taken of the excellent contribution which timber can make to wall construction in housing of all kinds.

Postscript on 'Breathing Papers'

Mr. Cleeve Barr writes:

Since the date of the Symposium I have been in correspondence on the subject of breathing papers with the Director of the Canadian National Research Council (Building Division), an ex-Liverpool man with a good knowledge of conditions in both Britain and Canada. He is emphatic on the value both of vapour barriers, on the warm side, and of water-repellent breathing-type papers, on the cold side, of frame walls. The Canadian Government Standard Specification, No. 9/GP/2, covers 'paper: building, sheathing, water repellent (breather type)', and, amongst other requirements, states that the paper shall have 'a minimum water vapour permeability of 3 grains per square foot per hour for a calculated pressure differential of 1 inch of mercury (approximately 2 grams per square metre per 24 hours for a calculated pressure differential of 1 millimetre mercury) when tested uncreased . . .'. This is in fact an extremely low rate of permeability and a number of ordinary, standard, British building papers are quite comparable in their water vapour permeability to this minimum standard. For example, a standard Union Kraft waterproof paper (consisting of two sheets of paper cemented with bitumen) of finished weight 67/68 lb. per ream has a water vapour permeability of upwards of 5 grams per square metre per 24 hours (B.S. 1133, Section 7/1952, Packaging Code).*

The Director of the Canadian National Research Council (Building Division) further mentions that the recommendations of the Norwegian Building Research Institute place particular stress on wind tightness (using a heavy, dense, building paper and lapping and clamping it at all joints between siding and sheathing and extending it over the edges of window and door frames, to be held between the frame and the trim), and 'the paper which they use does not appear to have any particular water-shedding property. . . .'

Obviously each country evolves its own standards according to its climatic, economic and other peculiar characteristics. I mentioned in my paper that certain firms building prefabricated houses had gone in for very large-scale pressure impregnation of all carcassing timber. One of the timber impregnation companies has since written in to say that timber which has been vacuum-pressure impregnated with a good preservative, whether it is used for studding in walls or for a suspended ground floor, *needs no ventilation*. This is, of course, an alternative approach which perhaps was insufficiently represented at the Symposium. On the other hand, a high degree of supervision, appropriate to prefabricated work but difficult to achieve in situ, would be required to ensure that no unimpregnated timber, whether from cut ends or faulty workmanship, was left exposed within a sealed cavity which was potentially liable to damp from any cause.

* 'It is a curious fact that although such a paper made into a bag will hold water quite successfully for some time, it is permeable to quite low water-vapour pressures.'

R. T. WALTERS, A.M.I.Struct.E. [*A*]

Timber Building Systems*

THIS TALK will be a rapid survey of the timber building systems which have been developed since the war. As there are so many different types, I am confining it to those which have some architectural pretensions and which are genuinely flexible—which offer a number of component parts which can be arranged in various ways to suit the designer of the building. I have excluded timber buildings which are complete in themselves, such as some of the houses designed for export, and also the more primitive huts, sheds and garages with which you are all familiar.

Systems Selected. This has left me with the 16 systems shown on this chart (Fig. 1). On the left, the manufacturers' names are

* Adapted for publication.

MANUFACTURER	NAME OF SYSTEM	CONSULTANT DESIGNER
A. H. Anderson Ltd.	A.75	Farmer & Dark
Cawood Wharton & Co., Ltd.	Cawood	—
C.D. Productions Ltd.	Punt, Mk. 1 & 2	Ove Arup & Ptnrs.
W. H. Colt, Son & Co., Ltd.	Colt	A. L. Osborne
Samuel Elliott & Sons (Reading) Ltd.	Elliott Frame	—
Samuel Elliott & Sons (Reading) Ltd.	Elliott—Single Storey	—
Vic Hallam Ltd.	Derwent	Samuel Morrison
J. E. Lesser & Sons, Ltd.	Middlesex	K. R. Powell and N. O. Morhaim
Medway Buildings and Supplies, Ltd.	Medway Mk. 4	Raglan Squire
Medway Buildings and Supplies, Ltd.	Medway Mk. 5	Architects Co-Partnership
Mod-X Structures Ltd.	Mod-X	D. Dex Harrison
Simms Sons & Cooke Ltd.	Sherwood	—
T.I.U. Ltd.	T.I.U. No. 4	F. W. Lancaster
J. Thorn & Sons, Ltd.	Thorn	Woodroffe, Buchanan & Coulter
Frank W. Toogood Ltd.	Toogood	—
Woodworth Joinery Ltd.	Kingswood	—

CHARACTERISTICS AND DISTRIBUTION								
Designed primarily for	Schools 13		Houses 1		General 2			
Size of Planning Grid	6′ 8″	6′ 4″	6′ 3″	6′	4′ 4″	4′	3′ 4″	2′
	1	5	1	1	1	1	4	2
Number of storeys	One storey—6				Two storeys—10			
Maximum clear span for roofs	20′–30′		30′–40′		40′–50′		50′–60′	
	6		—		9		1	
Maximum room height for single-storey buildings	8′	10′	12′	14′	15′	16′	18′	30′
	3	2	2	1	1	4	2	1
Partitions	Load-bearing 2		Non-load-bearing—8		Mixture 6			

Fig. 1. Chart showing 16 Timber Building Systems and the distribution of their basic characteristics.

given in alphabetical order with the name of the system in the next column. The third column gives the names of the consultant designers where they have been engaged by the manufacturers. In most cases the managements of the firms have taken a leading part in the development, and many of them have been greatly assisted by architects working in public offices. The public offices concerned are not shown on the chart, but I would like to mention the pioneer work done by the Herts County Council, and the encouragement and guidance which many of the manufacturers and designers have received from the Architect's branch of the Ministry of Education.

Characteristics and Distribution. The right-hand side of the chart shows some of the basic characteristics of timber building systems and how they are distributed among the 16 systems chosen.

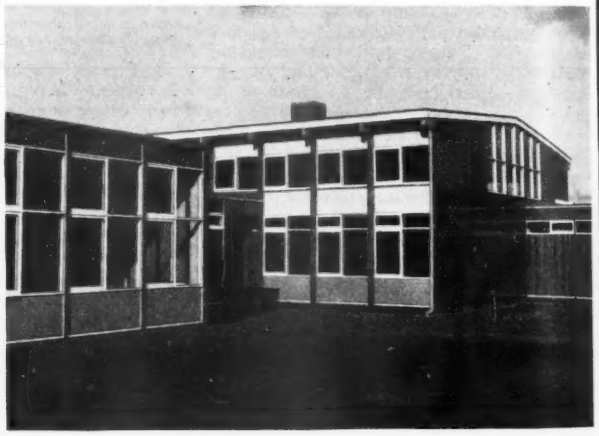
In the first line you will see that 13 of the 16 were designed primarily for schools. It costs a great deal of money to develop a system and to put it on the market. Manufacturers who are launching out with a new one like to feel that there will be a good demand for it, at least for a number of years, and most of them have aimed at the schools programme in the first instance. Nevertheless, all the systems can be used satisfactorily for a number of different types of buildings.

The next line shows the distribution of the planning grid sizes. The most popular size is 6 ft. 4 in. This has come about because it has been discovered that most primary and secondary schools can be planned satisfactorily on a grid of about 6 ft. When you are making timber wall panels, it is cheaper to make one about 6 ft. wide, than two about 3 ft. wide, and a panel about 6 ft. wide can still be transported and handled on the site quite easily. Dimensions such as 6 ft. 4 in. and 6 ft. 3 in. arise from stock size lining materials of 3 ft. and 6 ft., plus a structural space. In practice the cost of supplying and fixing plaster-board linings to the external walls, partitions and ceilings of a school is only between 3 per cent and 4 per cent of the total cost—so it is really an open question whether so much heed should be paid to the size of lining materials. The popularity of 3 ft. 4 in. as a grid size may have some connection with the publication, in 1951, of the British Standard First Report on Modular Co-ordination.

Six of the systems have been content with providing single-storey buildings, but ten of them are also suitable for two storeys. Most of the maximum roof spans fall within 40 ft. to 50 ft., which shows the influence of assembly hall requirements for schools. When it comes to maximum room heights for single-storey buildings there is no very clear preference, though the range between 14 ft. and 18 ft. is again influenced by assembly hall and gymnasium requirements. The bottom line shows that the majority of designers have gone for non-load-bearing partitions. Systems which have adopted this method gain by getting the building covered in quickly. On the other hand, some of the beams will lie over partitions which could be used to support the roof, so there is a degree of structural duplication. For this reason the practice of mixing load-bearing and non-load-bearing partitions is also popular.

Fig. 2. *Derwent System.* Hackenthorpe Junior School, Derbyshire. Architect: Samuel Morrison & Partners, [*AA*] in collaboration with F. Hamer Crossley [*F*], County Architect, Derbyshire

Fig. 3. *A.75.* Telford Avenue Junior School, Leamington Spa, Warwickshire. Architect: G. R. Barnsley [*F*], County Architect, Warwickshire



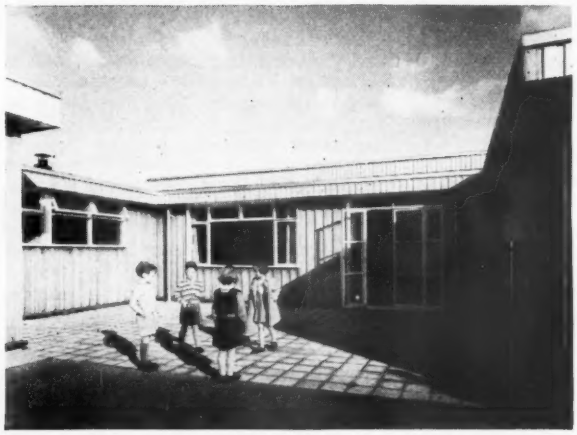


Fig. 4. *Thorn System.* High Halstow County Primary School. Architects: Woodroffe, Buchanan & Coulter [*F/A*] in collaboration with E. T. Ashley Smith [*F*], County Architect, Kent

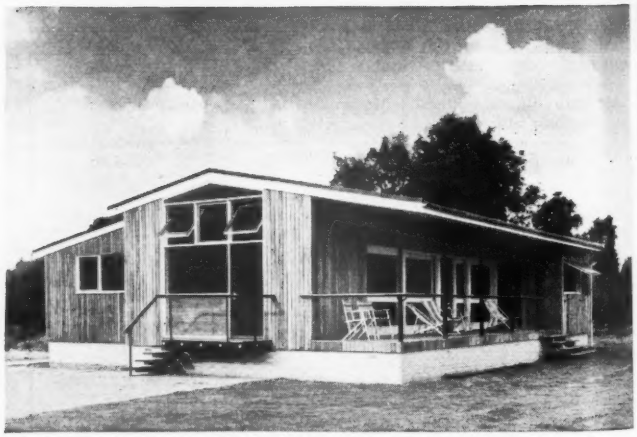


Fig. 5. *Mod-X.* Sports Pavilion, Oxford. Architect: G. J. Beard [*A*]

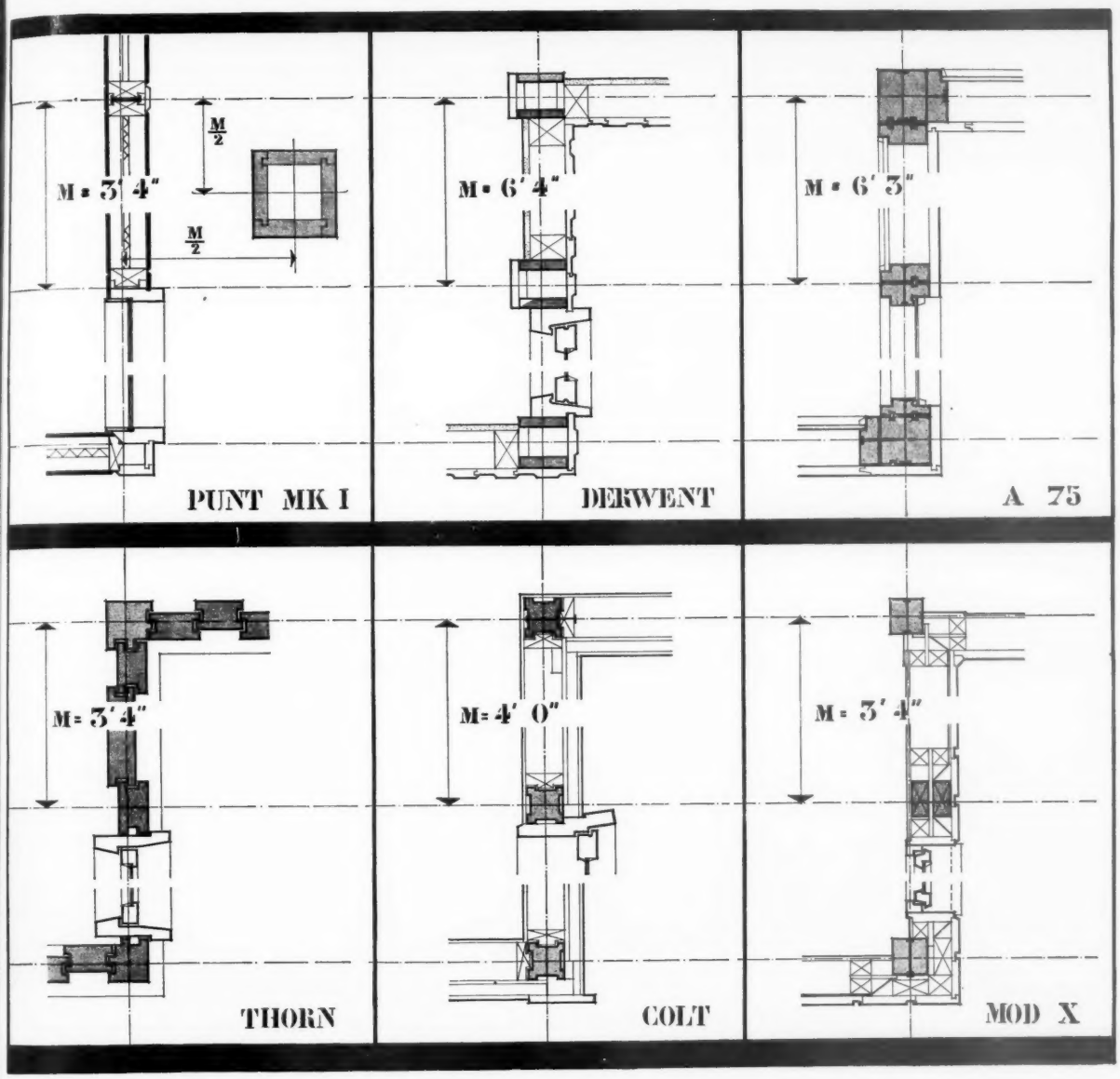


Fig. 6. Comparative Wall Panel Details

Punt System—Mark I. There will not be time to describe all the 16 systems and I have chosen six of them as a representative selection. The Punt System was one of the first to be produced and the first prototype was erected in 1952. Although its production has now been discontinued, the design is worth noting. It was based on a 3 ft. 4 in. grid. The Mark I version had columns placed off grid which carried laminated beams and lightweight roof units which were called 'punts'. The wall panels and internal partitions were non-load-bearing and were usually lined with hardboard. The system had a level ceiling so that the heights of the internal partitions were the same as the external wall panels. The external wall units were made in widths which were multiples of 3 ft. 4 in. and all the internal partition units were 3 ft. 4 in. wide. The punts were 1 ft. 4 in. deep, spanning up to 23 ft. 4 in., and occupied every other grid bay. The space between them was filled with square plywood infilling panels on the top and similar hardboard panels at ceiling level. Mark II of the Punt System was similar, but there were no columns and the punts were carried directly on load-bearing wall panels.

Derwent System. The Derwent System (Fig. 2) went into general production in 1953. It has a 6 ft. 4 in. planning grid and solves the thickness problem by having a 4 in. × 4 in. built-up column at every grid-line intersection. This allows all the external wall panels to be the same basic width, i.e. 6 ft. The vertical increment is 2 ft. The principle of having a 4 in. × 4 in. column at every grid intersection is also applied to the internal partitions. The plywood box beams are normally exposed and they vary in depth according to the span. Where a partition would occur under a beam, the beam is usually omitted and the partition is carried up to take the roof load. The roof panels consist of 4 in. × 1½ in. joists at 18 in. centres with ¾ in. tongued and grooved boarding fixed in the factory. As a rule the first layer of roofing felt is also applied in the factory to provide weather protection as soon as possible. The roof is insulated with Fibreglass and the plaster-board lining is fixed to the underside of the joists.

A.75 System. A.75 is a comparative newcomer and dates from 1955. The grid is 6 ft. 3 in., or 75 in., and hence the name 'A.75'. The structural principle differs from the Derwent System in that no columns are used for single-storey buildings up to 10 ft. in height and 4 modules span. For longer single-storey spans and for two-storey construction, a 4¾ in. square column is introduced between the panels. As this is the same size as the corner posts, the whole of external wall panel range is covered by taking a basic 6 ft. 3 in. wide panel and making it short by 2⅜ in. either at one end or both ends, as required. The illustration (Fig. 3) shows a block with no columns in the foreground and an assembly hall with columns and a pitched roof behind. The beams are plywood box construction and the system has a level ceiling throughout. The ceiling panels are supported by the lower flange of the beams and are removable for access to services. As is usual with systems of this kind, erection begins in one corner of the building, proceeds across the end and round the other corner. As soon as the first beam can be placed the roof panels are added and the building is closed in as it goes. The roof panels are made of solid 2 in. tongued and grooved softwood spanning the full distance between the beams and providing insulation at the same time.

Thorn System. The Thorn System (Fig. 4) is quite unlike any of the others. The wall panels are made of interlocking pieces of 3 in. thick solid hardwood, with a post every 3 ft. 4 in. which also interlocks with the panels. The resulting wall looks the same inside and out and does not need lining at all. The system is at present designed for single-storey buildings only up to 46 ft. 8 in. span. Ceilings are level throughout and can be lined with a number of different sheet materials. The partitions are exactly the same as the external walls and, if lined with plaster board, a very high sound resistance is claimed for them. The roof construction is also unusual. The beams are placed at 3 ft. 4 in. centres and consist of 3 in. square members with 3 in. spaces between them. Through the spaces are threaded spars going in the other direction. The number of members making up the beam can be increased as the span increases. The hardwood used in this system is Keruing with the beams and spars made of softwood.*

Colt System. The Colt System is the only one designed primarily for houses. It has a 4 ft. grid chosen as the maximum possible for domestic planning. The structure consists of 2¾ in. square posts at every grid intersection with load-bearing panels between them. The structure and joinery throughout are made from Parana Pine, which comes from South America. Roofs are covered with Western Red Cedar shingles and the external walls either with shingles or cedar weatherboarding. The first floor is carried by a system of primary beams at 4 ft. centres which have a maximum span of 24 ft., and secondary beams at right angles to them. The floor panels, nominally 4 ft. square, are thus supported on all four sides. All the partitions are, or can be, load-bearing. The roof trusses are also spaced at 4 ft. centres and there is one intermediate rafter between them if shingles are used, and two for tiles. Normally the manufacturers agree on the design of the house direct with the client and will arrange to see it through the local authority and have it erected by a local builder.

* This system is the subject of British Patent No. 749003 and is referred to for convenience as the Thorn System.

Mod-X System. Mod-X (Fig. 5) is perhaps the most flexible system of them all. It was not designed with any particular building type in mind but is intended to be suitable for any building in any part of the world. It is based on a 4 in. module and a 3 ft. 4 in. planning grid. It has a structural frame which can either be all timber or all steel, or a combination of both. All the wall panels and partitions are non-load-bearing, and the idea is that, in overseas countries, the frame can be used with indigenous materials. The timber frame, which we are concerned with tonight, consists of 3 in. × 3 in. columns at 3 ft. 4 in. centres, and a system of solid beams which may be horizontal or inclined. The window units in the external walls are made separately from the solid panels. The normal roof covering for flat roofs is 2 in. Stramit slabs covered with roofing felt. The system is fully demountable and will build single- or two-storey buildings. The maximum height for single storey is 12 ft. 8 in. with a timber frame and 30 ft. with a steel frame. Unlike the other systems, the frame is erected first and the infilling panels added afterwards. Ceilings are lined with ½ in. Asbestolux below the secondary beams.

Comparative Wall Panel Details. This drawing (Fig. 6) shows the wall panel details of the six systems so that you can compare one with the other. All the sketches are drawn with the outside of the building on the right and the external corner at the bottom. In effect you have six different ways of solving the same basic problems.

In the Mark I Punt System, the solid wall panels were made of two sheets of fibreboard with a fibreboard honeycomb between them set in a timber frame. The external skin was either plywood or vertical hardwood weather-boarding and the internal lining was in hardboard. The panels came to the site finished on both sides and were fixed together with metal clips and bolts. The grid lines were placed 1 in. within the external walls, i.e. half the partition thickness.

The Derwent System panels are framed up in softwood with the external hardwood cladding fixed in the factory. The ½ in. plaster-board lining is fixed on site both for the external panels and the partitions. This makes it easy to bolt the components together and allows services to be run in the walls without difficulty. The grid lines run centrally through the 4 in. × 4 in. columns. For two-storey construction these columns are laminated solid and in some cases a projecting fin is added on the inside of the building.

In the A.75 detail you can see how the stiles of the wall panels meet to form a column. Hardwood tongues are inserted as an additional moisture check and the internal lining of ½ in. plaster board is added after the panels have been erected. The joint at the corners is made by inserting a bolt with a ring on the end of it into the column and passing another bolt through it at right angles. The grid lines pass through the centre lines of all external walls and partitions. Partitions are normally in Paramount and are non-load-bearing throughout. The level ceiling allows them to be of even height in either direction.

The plan of the Thorn System shows how the solid pieces of the wall panels interlock with each other. Each piece is centred on the 4 in. module.

In the detail of the Colt System you see the 2¾ in. square columns at the grid intersections. The panels are faced externally with ½ in. insulation board, then building paper, then horizontal battens at 6 in. centres. The exterior cladding is fixed on site, so is the internal lining of ½ in. insulation board. This wall has a U-value of 0·186. The holes in the corner columns are slotted so that two bolts can pass one another at right angles.

The wall panels of the Mod-X System are made up of 3 in. × 1½ in. members with plywood tongues which locate the panels against the columns. The external corner is turned by the addition of two 3 in. × 1½ in. studs, and the intermediate column in this case is formed of two similar studs. The members are bolted together with ½ in. diameter bolts.

Comparative Beam to Column Details. [The speaker then showed a slide comparing the beam to column details of the six systems and explained the method of making the junction in each case.]

Conclusion. I cannot tell you how many prefabricated timber buildings have been erected since the war, but the Ministry of Education has given me some information about the schools programme. Excluding 'minor works', that is, jobs costing less than £10,000, timber buildings in England and Wales provided 15,500 places in the year 1956–57, that is about 6·4 per cent of the total. This was 1·3 per cent higher than the year before.

Timber building systems have the usual advantages—savings in drawing office time and speed of erection on the site. A high standard of design is essential if a system is to succeed with architects, and the best way to achieve this is to form a design team with manufacturer's people on one side, who know about production, costs and sales, and architects and engineers on the other. If the right people get together, and if they can decide at the outset precisely what the system is for and what its limitations are going to be, the result should be a success. My only regret about the systems I have shown you is that they are all 'closed'. I know that it takes a great deal of hard work to design a satisfactory system at all, but it is still a pity that in no case are the parts of one system interchangeable with any of the others.

A. C. OLIVER, M.Sc.

External Clear Finishes for Timber

IT IS COMMON KNOWLEDGE that untreated timber when used in any external situation weathers down rapidly to a grey colour.

Various surface treatments have been devised to prevent this and other weathering effects. In this paper I shall describe some of the methods used, their merits, and factors to be considered when selecting timber and timber species.

As mentioned, the main immediate effect of weathering is the loss of the original colour of the wood. Other results include 'raising of the grain,' especially with softwoods, the development of small splits on the surface, warping and twisting, especially with thin pieces of wood, and, after a period of years, a disintegration of the surface fibres. It has been stated that the actual rate of deterioration due to weathering is of the order of $\frac{1}{4}$ in. in 100 years.

Decay, that is attack by fungi, will only occur if the moisture content of the timber is above 20 per cent for protracted periods.

Causes of Weathering

(*a*) *Moisture*. Repeated dimensional changes due to alternating periods of high and low relative humidities are mainly responsible for the development of surface checking and friation. They also cause the raised grain typical of weathered softwood.

These dimensional changes are due to the hygroscopic nature of wood—i.e. its affinity for water—and as moisture vapour transfuses only very slowly through wood, and periods of high humidity are usually of short duration, they only affect the surface layers of timber. This explains why the rate of weathering deterioration is as slow as $\frac{1}{4}$ in. in 100 years.

(*b*) *Light*. Sunlight, especially the ultra-violet portion, is largely responsible for the loss of colour of weathered timber, but it also causes chemical breakdown. The speed of this process is increased by the surface checking caused by movement. All efficient surface coatings should possess some form of ultra-violet barrier in order to prevent colour changes and chemical breakdown.

(*c*) *Mechanical causes*. The mechanical effects of rain, hail, frost, snow, sand and dirt, coupled with the wind, also contribute towards the general effects of weathering.

However, timber can be used externally without finishing, provided that the 'weathered' grey colour which it will assume is not considered objectionable. It must be below 20 per cent moisture content unless a durable species is used.

Results of Applying a Finish. The main reason for applying a finish is to reduce the effects of weathering. It must be made quite clear that a finish only protects timber from fungus or insect attack so long as it remains intact and once its surface has been broken anywhere, the way is clear for decay to set in.

Other effects of clear finishes include:

(1) The sheen and texture of the 'coat' is substituted for that of the wood. It has a high refractive index which brings out the figure of the wood and intensifies the natural colour. This intensification increases with the penetration of the finish.

(2) The surface coating reduces the absorption of moisture vapour and consequently dimensional change is retarded. This is equally true of paints and varnishes. If a surface coating completely sealed the wood, dimensional change would be prevented and weathering could be considerably slowed down.

(3) Paints possess pigments which have the property of absorbing ultra-violet light. Modern clear finishes do not, as yet, include an ultra-violet barrier as good as a pigment, and it is for this reason that they deteriorate much quicker than paints.

Preservation. Under some circumstances it may be considered necessary to preserve timber before finishing and it would be desirable at this stage to make a few general recommendations on the types of preservatives to use.

Preserved timber is, of course, not liable to attack by insects or fungi. Preservatives will also prevent the attack of sap-staining fungi, which although incapable of causing any structural damage to timber, may cause unsightly black marks if sapwood is used in external situations.

If a clear finish is to be employed and the original colour of the wood retained, one must avoid any preservative which stains or colours timber. Most water-borne and creosote type preservatives must be eliminated on this score—but colourless organic solvent and some tar oil type preservatives can be used. In addition, the effect of the preservative solvent must be considered. Pressure-treated water-borne preserved timber must be re-seasoned or kiln-dried after treatment, with perhaps a little distortion. Creosote preserved timber which causes blistering in any finishing coat must be weathered for about twelve months in order to loose the surface tar coloration and allow evaporation of the heavy oils to take place. Organic solvent types, on the other hand—those with light oil solvents—dry out quickly and can be varnished or painted within a week.

Fire. Many local bye-laws may require the use of fire-proofed timber. There are two main methods of treating timber to increase its resistance to fire.

First, wood can be impregnated with water-borne salts. As with water-borne preservatives, the timber must be re-dried after treatment. These salts are liable to leaching by rain-water and are not fixed in the timber in the same way as good modern preservatives are. Consequently a surface coating must be applied. Most of these fire-proofing chemicals do not colour the wood and clear finishes can be applied after treatment, but the treatment may reduce the durability of the finish.

Second, fire-resistant paints can be applied, but their use comes outside the scope of this paper.

Clear Finishes. It must be admitted that the clear finishes at present available are less than half as resistant to weathering when compared with paint. House paint should last about five to six years and a similar period may elapse before subsequent renewals are required. Clear finishes may last two years, but annual renewal is often necessary on areas fully exposed to rain and sun, such as the lowest areas on south-facing sides of buildings. Conversely, on the highest areas of north sides of buildings, coatings may last twice as long.

If renewal is necessary, it must not be delayed as areas where surface has broken down begin to weather and sanding down will be necessary to remove layers of grey timber.

Ageing. The action of light on wood treated with clear finishes causes the yellows and reds to turn brown and the protective finish also darkens. This ageing action is slow but it often enhances the coloration of the wood.

Types of Clear Finishes. Clear finishes can be divided into three types. (1) oil, (2) sealer, (3) varnish.

Oil and sealer are penetrating finishes, while varnishes are primarily surface coatings.

1. *Oil*. The oils are best applied as penetrating finishes. They have the lowest degree of lustre or gloss of the three types and they also darken the wood, increasingly so according to their penetration and ageing.

Linseed oil is the most commonly used oil for surface treatment of timber. It is available in two forms, raw and boiled. Raw oil is thin and light in consistency but takes a very long time to dry. Boiled oil is darker and thicker than the raw, and, as it contains metallic drier, dries quicker.

When applying linseed oil, it is always essential to rub in well and leave no excess on the surface. Too heavy coatings will run and wrinkle. Also linseed oil is liable to be attacked by mould growths but its main drawback is that it always remains tacky and holds dirt. The addition of thinning solvents, turpentine, white spirit, naphtha etc., to linseed oil assists penetration and eases the removal of excess oil from the surface.

Bodied oils, which consist essentially of linseed oil–tung oil mixtures, do not penetrate as well as linseed oil and therefore require extra special care for wiping off.

Pigmented Oils. The addition of a small quantity of pigment to oil finishes (e.g., $\frac{1}{2}$ pint of burnt sienna ground in oil to a gallon of oil), or equivalent quantities of white, cream or grey paint, is sometimes employed to increase durability of the finish, it masks uneven wood coloration (e.g., sapwood) and the colour changes of the ageing processes are reduced and concealed.

Preservative-oil Mixtures. Pentachlorphenol wood preservatives can be mixed

direct with linseed oil in order to prevent mould growth.

2. *Sealer*. These are also penetrating finishes but they do not penetrate as much or as deeply as the oils. However, sealers possess greater lustre and glossiness. They are similar to a varnish in composition, their difference lies in application method. After application, excess 'seal' is wiped off, as with oils, and therefore they sink into and saturate the wood surface; a surface coating is not produced.

The main type of sealer is composed of a thinned varnish—up to 50 per cent thinner being added. Pigmentation can be obtained by adding small quantities of paint or pigments as with the oils.

Water Repellents. These are often sold under the name of 'wood seals' but are not intended for use as finishes. Many contain preservatives and their prime function is to retard dimensional changes of timber and prevent fungal and insect attack. They are particularly designed for use as treatments, on joinery, etc., which is often left exposed to the weather on building sites during construction.

They consist essentially of pentachlorphenol with a hydrocarbon wax mixed in mineral volatile solvents. They are often supplied pigmented.

They have no adverse effects on any subsequent finishing operations.

3. *Varnish*. A varnish finish is one which produces a surface coat of appreciable thickness. It is normally applied as two or three coats, the first being thinned to increase penetration. Generally, the greater the number of coats applied, up to about six, the greater the durability of the finish. Varnish coatings have a much greater gloss and lustre than the other types, they darken the wood colour and are not rubbed in during application.

There are two main types of varnish, the oleoresinous and the synthetic. Both types are composed of resin, vehicle, drier and solvent.

Oleoresinous varnishes. These are all of the long oil type and are made from natural resins, copals, pontianak and manillas. High quality copals are the best, but they are all inferior to the synthetic varnish.

Synthetic varnishes. These contain synthetic resins of various types, including, alkyds—glyptals, epoxy or epikote, phenolformaldehyde, urea-formaldehyde.

Varnishes can also be classified into three groups, according to the vehicle—resin ratio, the short, medium and long oil types. Exterior varnishes are all of the long oil type, that is containing 40–100 gallons per 100 lb. resin. High proportions of oil reduce brittleness and gloss but increase elasticity and toughness. Durability is increased but drying is slower.

Spirit Varnishes which consist of resin dissolved in a volatile solvent are quick-drying but brittle, have a very low water resistance and are not suitable for exterior use (shellac and damar are of this type). The same remarks apply also to french polish and cellulose lacquers.

Drying oils (vehicles). These may be tung oil–linseed oil, soybean oil or perilla oil. Tung oil is the most usual. They are known as drying oils owing to the oxidation reactions they undergo—drying taking place by oxidation as well as by evaporation.

Metallic driers—zinc, lead, manganese, etc., assist this oxidation-drying reaction.

The solvents assist in drying and increase penetration of the varnish into the wood.

Performance. It is generally admitted that the quality of product, i.e., choice of raw material and preparation and care during application, is as important as the type of finish. Many modern varnishes consist of mixtures of natural and synthetic resins, but it can be said that alkyd and phenolformaldehyde resin-based varnishes are the best available at the moment.

Preservative stains (shingle stains). Owing to the short 'life' of clear finishes, preservative stains are often used. These are essentially mixtures of varying amounts of pigment in creosote and with small additions of oils and solvents. They stain and preserve timber, prevent the colour changes associated with weathering, and do not require too frequent maintenance. They are in no sense clear finishes but as they do not have such a high pigmentation as paint, they do not obscure the grain or figure of the wood.

Application. It is essential to allow timber to acquire the equilibrium moisture content of the situation where it is to be used. If the timber is too wet, it will shrink and the surface coating will blister. If on the other hand it is too dry, it will expand and possibly crack the surface coating.

In order to improve dimensional stability, the timber can be end-sealed and back-primed.

Timber. We must finally consider the factors affecting selection of timber for exterior use.

Selection of Timber. When selecting individual boards within one species, the following points should be remembered. Weathering characteristics will be improved if the wood is: (i) slow grown; (ii) quarter sawn; (iii) barkside outermost—if flat sawn timber is used, preventing surface flaking and curling out; (iv) clears—no knots; (v) planed surfaces; (vi) designed to be used in thicker boards, reducing liability to twist, etc.; (vii) resin and gum free.

When selecting species other features should be considered including: (i) dimensional stability; (ii) small pores (vessels) if hardwoods used; (iii) non-resinous or other extraneous materials, e.g., tannins; (iv) colour; (v) action with ferrous metals. If this occurs galvanised, copper or plated nails or fixings must be used to avoid corrosion and staining.

As there is little information available on the weathering characteristics of various species in our climate, the Timber Development Association is collecting and collating information on this subject, and also on the painting and varnishing characteristics of the timber species commonly available on the market at the moment.

A few timber species can be recommended after consideration of the factors mentioned above, for use in external situations with a surface coating.

Softwoods: Corsican Pine, Douglas Fir, European Redwood, Parana Pine, Western Hemlock, Western Red Cedar,* Whitewood.

Hardwoods: Afrormosia,* Gedu Nohor, Idigbo, Iroko, African Mahogany, Makore, Mansonia, Red Meranti, Opepe, Sapele, Teak, Utile.

All the hardwoods and Western Red Cedar will give a satisfactory performance untreated. The other softwoods will probably require finishing.

Conclusions. Clear finishes are not at the moment very durable or long-lasting when wholly exposed to weathering action. Alkyd and phenolic resin based finishes have the best resistance.

The creosote preservative stain is probably the most economic and long-lasting finish suitable for treating timber in external situations.

(*Mr. Oliver showed a number of slides of weathering tests.*)

T.D.A. Weathering Tests

Some twelve months ago, the T.D.A. embarked on a series of tests to determine the efficacy of various proprietary external clear finishes for timber and also the weathering and varnish-holding characteristics of selected wood species.

Tests were initiated at three sites—Brighton, London and Tylers Green, Bucks, in order to investigate the effects of marine, industrial and rural atmospheres. So far nine finishes and five timber species have been investigated. The following general inferences can be drawn from the results obtained so far.

Even allowing for the accelerated conditions produced by the angle of exposure (15 degrees from the horizontal), the majority of finishes break down fairly rapidly. The best resistance was obtained with a phenolformaldehyde resin-based varnish, but it is very doubtful if even the best finish will last over three years even under conditions of average exposure.

Linseed oil if applied thickly picks up dirt from the atmosphere—producing a most unpleasant effect.

Light is the most important cause of breakdown. Dirt deposition in industrial areas may increase the 'life' of a finish as breakdown in London was slower than at Tylers Green.

Of the five timber species tested, Western Red Cedar, Red Meranti and Sapele maintained the varnish better than Idigbo and Oak. Oak is a particularly difficult timber and most finishes break down on it in about four months. All species when untreated, weathered down to a silver grey colour differing only slightly from the familiar grey colour of weathered cedar.

Editor's Note.—It is regretted that there is not space in this issue of the JOURNAL *for the discussion following the symposium. If possible it will be printed in the July* JOURNAL.

* Attacks ferrous metals.

Practice Notes

Edited by Charles Woodward [*A*]

IN PARLIAMENT. Contracts (Printed Conditions). In answer to a question the Attorney-General said that the Lord Chancellor would consider the question of the desirability of changing the law relating to printed conditions in contracts between commercial concerns and individual members of the public when he next came to select a question for reference to the Law Reform Committee. (15 April 1957.)

Planning Appeals: Basis of Decisions. Mr. John Hall asked the Minister of Housing and Local Government to what extent his decisions in planning appeals were based on the evidence given at the inquiries, and what other considerations were taken into account.

Mr. H. Brooke: In determining a planning appeal, I am under an obligation to have regard to the provisions of the development plan for the area and to any other material considerations. The evidence given at the inquiry will normally constitute the most important of these considerations; and the extent to which other considerations may have to be taken into account will vary according to the circumstances of the particular case. It is the practice to set out in the letter announcing my decision not only a summary of the evidence given at the inquiry but also the reasons for the decision. (7 May 1957.)

New Towns (Green Belts). Mr. Remnant asked the Minister of Housing and Local Government under what circumstances building is permitted in Green Belts round new towns.

The Minister of Housing and Local Government and Minister for Welsh Affairs (Mr. Henry Brooke): New building in areas which it is agreed should be defined as Green Belts is being confined to building for agricultural purposes or other uses appropriate to a rural area, apart from a strictly limited amount of 'infilling' or 'rounding off'. There is no difference for this purpose between a Green Belt round a new town and one round an old town. I am sending my hon. Friend a copy of a circular on this subject which was sent to local planning authorities by my predecessor.

Mr. Remnant: As a result of that answer, can my right hon. Friend give an assurance that there will be no difference in treatment as between a local authority and a development corporation?

Mr. Brooke: The local authority is the planning authority, but if there is an appeal made to me I take everything into account and try to give proper weight to all the evidence that is before me and all the knowledge that is available. There is certainly no discrimination in favour of development corporations of new towns. (7 May 1957.)

NATIONAL JOINT COUNCIL FOR THE BUILDING INDUSTRY. Wage Claim. At its meeting in London on 9 May the National Joint Council for the Building Industry gave further consideration to the 4d. an hour wage claim submitted by the building operatives and decided that with effect from 27 May building wages would be increased by 1½d. an hour. In February the Joint Council increased building wages by 1d. an hour under the industry's cost of living sliding scale agreement, so that with the new decision this year's building wage increase amounts to 2½d. an hour. From 27 May the new London and Liverpool hourly rates are 4s. 7½d. for craftsmen and 4s. 1d. for labourers (£10 3s. 6d. and £8 19s. 8d. respectively for a 44-hour week). The new Grade A hourly rates—which cover the major part of the rest of the country—are 4s. 6d. for craftsmen and 3s. 11½d. for labourers (£9 18s. and £8 14s. 2d. respectively for a 44-hour week).

Watchmen's rates from 27 May are:—

London and Liverpool	25s. 0d. per shift
Provinces	23s. 9d. per shift

Increased Wages need not Increase Costs. The President of the N.F.B.T.E., Mr. Leonard A. Walden, said on 20 May:

'*If* jobs are planned completely in advance, *if* contractors continue to improve the efficiency of their organisations, and *if* the operatives further increase their output, the recently agreed increase in wages should not lead to higher building costs. Only a small all-round effort is necessary and I confidently appeal to all concerned—building owners, professions, contractors and operatives—to see that it is forthcoming.'

MINISTRY OF HOUSING AND LOCAL GOVERNMENT. Fixed Price Tendering. Circular 31/57 dated 21 May, addressed to the Clerk of an Authority or Board and the Secretary of the Company refers to the statement of the Minister of Works regarding Fixed Price Tendering, and states that the Associations of Local Authorities have been informed of the policy of Government Departments and that the Minister wishes to recommend to the Authority or Board or Company that similar action should be taken, in accordance with their individual circumstances, when letting future contracts for building or civil engineering work.

(The reference to Company is to Statutory Water Companies.)

COPYRIGHT ACT 1956. This Act came into operation on 1 June and contains the following provisions which concern architects:

Definitions.

'Building' includes any structure.

'Construction' includes erection.

'Drawing' includes any diagram, map, chart or plan.

'Engraving' includes any etching, lithograph, woodcut, print or similar work not being a photograph.

'Work of joint authorship' means a work produced by the collaboration of two or more authors in which the contribution of each author is not separate from the contribution of the other author or authors. (Section 48.)

(*a*) 'Artistic work' means, irrespective of artistic quality, paintings, sculptures, drawings, engravings and photographs.

(*b*) Works of architecture, being either buildings or models for buildings.

(*c*) Works of artistic craftsmanship not being works under (*a*) or (*b*). (Section 3.)

Copyright in every original 'artistic work' belongs to the author who is a 'qualified person', i.e. a British subject or British protected person or a citizen of the Republic of Ireland or who is domiciled or resident in the United Kingdom or of another country to which the provisions of the Act extend. In the case of a body corporate 'qualified person' means a body incorporated under the laws of any part of the United Kingdom or of another country to which the provisions of the Act extend. (Section 1.)

Copyright expires at the end of fifty years from the end of the calendar year in which the author died. (Section 3 (4).)

Copyright in a photograph or painting or drawing of a portrait belongs to the person who orders and pays for it. (Section 4 (3).)

Copyright in a work made under a contract of service or apprenticeship belongs to the person who employed the author of the work, subject to any agreement to the contrary. (Section 4 (4) (5).)

Copyright in an 'artistic work' is *not* infringed:—

(*a*) by fair dealing with it for research or private study;

(*b*) by fair dealing with it for the purpose of criticism or review, subject to a sufficient acknowledgment;

(*c*) by making a painting, drawing, engraving or photograph of an 'artistic work' permanently situated in a public place or in premises open to the public or its inclusion in a cinematograph film or in a television broadcast, being sculptures and works of artistic craftsmanship;

(*d*) by making a painting, drawing, engraving or photograph of a 'work of architecture' or its inclusion in a cinematograph film or in a television broadcast;

(*e*) by publication of a painting, drawing, engraving or photograph of an 'artistic work' or a 'work of architecture', if the making did not constitute an infringement of copyright;

(*f*) by the making of a subsequent 'artistic work' by the same author with part of the earlier work being reproduced in the subsequent work, provided that the author does not repeat or imitate the main design of the earlier work;

(*g*) by reconstruction of a 'work of architecture' in which there is copyright; and where a building has been constructed in accordance with architectural drawings or

plans in which there is copyright, and has been so constructed by or with the licence of the owner of that copyright, the use of the drawings or plans in any subsequent reconstruction is not infringement of that copyright. (Section 9.)

Regulations made in respect of libraries and archives and Rules in respect of industrial designs have been laid before Parliament.

This Act repeals the Copyright Act, 1911, except Sections 15 and 34 which deal with delivery of published books to the British Museum and compensation to certain libraries for the loss of the right to receive gratuitous copies of books.

CONDITION OF CONTRACT FOR OVERSEA GOVERNMENTS. General Conditions of Contract applicable to contracts entered into by Crown Agents on behalf of their Oversea Principals have been revised and came into effect in June. Tender forms issued from 1 June will indicate that the new Conditions apply.

Copies of the Conditions of Contract are obtainable from the Crown Agents, 4 Millbank, London, S.W.1, quoting the reference O/Sec.245.

LANCASHIRE COUNTY COUNCIL.

Report on the Preservation and Improvement of Amenities. This report describes the policy of the County Planning and Development Committee in relation to amenities and applications for planning consent. Such applications range from outdoor advertisements to large industrial installations, and total more than 14,000 each year.

The report states that it is part of the day-to-day function of the County Planning Department to eliminate, as far as possible, the more blatant vulgarities of design which are submitted for approval and to attempt, by advice and assistance, to influence the design, lay-out and appearance of buildings towards a better standard. This problem is largely one of taste, style and competence, and frequently modifications are agreed which are acceptable both to the Committee and to the applicant, sometimes with a substantial saving in cost to the latter. So far as local authority is concerned, the Committee has frequently been requested to assist local councils in the design and layout of housing schemes, and in this collaboration particular emphasis is given to the amenities. The assistance which the Planning Department is able to give in this type of work includes preliminary design, siting and landscape treatment, the essential elements which make for pleasing results. In this report the definition of 'amenity' is very wide and comprehensive.

LAW REPORT

Critchell v. Lambeth Metropolitan Borough Council. In the Court of Appeal the Borough Council appealed against the judgment of the County Court Judge who quashed a closing made by the Council under Section 12 of the Housing Act, 1936, in respect of certain basement rooms of which Mrs. Critchell was the owner.

The rooms were substantially below ground level and were 'underground rooms' within the meaning of the Housing Act, 1936. The Council had made the closing order on the ground that the premises were unfit for human habitation by virtue of the provisions of their local regulations which dated from 1911. The County Court Judge had quashed the order, holding that the regulations had been superseded by the provisions of Section 9 of the Housing Repairs and Rents Act, 1954. One of the regulations dealt with the minimum height required above the level of the ground outside and the width of the area or courtyard outside.

It was submitted on behalf of Mrs. Critchell that Section 9 of the 1954 Act applied the same standard to all dwelling accommodation, whether a house in the sense of a separate building, or a house in the sense of a separate dwelling, or even to rooms let as lodgings, and that the premises concerned being a flat, a separate dwelling constituted a house within the meaning of the 1954 Act.

In giving judgment the Court said that the appeal raised a difficult point arising from the language of the two Acts. The courts did not lightly consider one Act as repealing another, and Parliament could have said expressly that Section 9 of the Act of 1954 superseded the old provisions. In the case of Board of Governors of the London Hospital *v.* Jacobs (February 28 1957) the Court of Appeal had clearly expressed the view that Section 9 of the 1954 Act superseded Section 12 of the Act of 1936, and now provided the only standard by which fitness for human habitation was to be judged. In this case the Court felt bound to apply that authority and accordingly dismissed the Council's appeal. (THE ESTATES GAZETTE, 18 May 1957.)

[**Note.** The standard of fitness for human habitation as defined in Section 9 of the 1954 Act, requires regard to be had to repair, stability, freedom from damp, natural lighting, ventilation, water supply, drainage and sanitary conveniences and facilities for storage, preparation and cooking of food and for the disposal of waste water. A house is deemed to be unfit for human habitation if it is defective in one or more of these matters so that it is not reasonably suitable for occupation in that condition.

Section 132 of the Public Health (London) Act, 1936, prohibits the occupation of an 'underground room' the definition of which is similar to that in the Housing Act, 1936. Can it be said that Section 9 of the Act of 1954 supersedes Section 132 of the 1936 Act so far as the standard of fitness for human habitation is concerned?

The term 'working classes' in the Housing Act, 1936, was repealed by the Housing Act, 1949, and it would appear that the same standard of fitness for all dwelling accommodation would be applied to all such accommodation.]

I.U.A. Notes

MESSAGES OF CONDOLENCE have been received from National Sections of the I.U.A. all over the world on the occasion of the death of Sir Patrick Abercrombie, the first President of the International Union. Professor Jean Tschumi, the present President of the I.U.A., has paid tribute to his memory in an appreciation published in the May edition of the I.U.A. BULLETIN.

United Nations. The United Nations have recently published an important catalogue which contains brief résumés of all films appearing throughout the world on the subject of architecture, its development and problems in the widest context. This catalogue is called 'Housing, Building, Planning'.

O.E.E.C., *European Productivity and Building.* The April number of the bi-monthly review of E.P.A., EUROPEAN PRODUCTIVITY, is a special edition under the title of BUILDING. Personalities in the building world contribute to the edition and emphasise the need for industrialisation. Particular attention is given to the planning of work undertaken, prefabrication and modular co-ordination.

Modular Co-ordination. The 'Theory Group' will meet in Copenhagen from 18 to 20 May and the 'Working Group' in Copenhagen and Stockholm from 20 to 24 May. These groups will examine in particular the plans of modular components which will be used in type constructions and will discuss a proposal for a standardised European module.

Germany. The death is announced of Paul Bonatz who was 79. Paul Bonatz played an important part in the development of contemporary architecture.

U.S.A. Mr. Pier Luigi Nervi, the Italian architect and engineer, has been elected an Honorary Member of the American Academy and of the National Institute of Arts and Letters. The number of foreign Honorary Members is limited to 50. This honour is conferred on people who have distinguished themselves in the field of the arts.

Iraq. Messrs. Minoprio and Spencely and P. W. Macfarlane have been nominated by the Iraq Development Board as co-ordinating consultants for the civil and governmental centres at Bagdad.

It is intended that this centre should include the town hall, the law courts, the police headquarters, a public library, post offices, three mosques and five or six other public buildings.

Plans are, moreover, being considered for extending this centre to the Tigris river. The administrative centre is situated round the new Houses of Parliament, which are at the moment being constructed. The centre will include new ministries and government departments.

The NEW YORK TIMES announces that

Frank Lloyd Wright is to go to Bagdad to design and construct an opera house.

Italy. The 11th International Triennale Exhibition of modern decorative and industrial arts and of modern architecture will take place in Milan from 27 July to 4 November 1957. The following are the main subjects upon which the Exhibition will be based: Contact between the arts; contemporary architecture; artistic production and industrial design. The complete programme and arrangements can be obtained from the 11th Triennale of Milan, Palazzo dell' Arte Al Parco, Milan, Italy.

Yugoslavia. The death is announced of Josef Plecnik, Professor of Architecture at the University of Ljubljana and of the technical schools of Vienna, a member of the Slovene Academy of Science and the Arts, an Honorary Corresponding Member of the R.I.B.A. and a pupil of Otto Wagner.

A.B.S. Homes at East Horsley, Surrey. Architects: Clifford Culpin and Partner [*F*/*A*]. Drawn by William Suddaby

A.B.S. Annual General Meeting

THE ANNUAL GENERAL MEETING of the Architects' Benevolent Society was held in the rooms of the R.I.B.A., 66 Portland Place, London, W.1, on Tuesday 7 May 1957, at twelve noon. In the absence abroad of the President, Mr. Kenneth Cross, the Chair was taken by Mr. H. S. Goodhart-Rendel, C.B.E., Vice-President and Honorary Treasurer. Mr. Kenneth Cross was re-elected President of the Society. The Honorary Officers, Vice-Presidents, Honorary Auditors and Council were elected for the year 1957–58.

The Honorary Secretary, Mr. Howard Lobb, C.B.E. [*F*], in presenting the Annual Report, stressed the fact that owing to the rising cost of living many pensioners were having the utmost difficulty in making ends meet, and the Society must have more money to help the many cases of need. In connection with this he referred to the work of the Society's local representatives, which was greatly appreciated, and the visits they had paid to applicants had not only provided useful information, but had also helped to cheer those they visited.

Mr. Lobb said that the Council had just authorised the A.B.S. Homes Trust to sign the contract for the construction of the first part of the Homes scheme, and work would be starting immediately. It was hoped that this first part would be completed by the end of the year. The Society should feel very grateful to the architect, Mr. Clifford Culpin, for all the care and thought he had put into the scheme.

Nearly half the money which had been raised for the Homes so far had been provided by the A.B.S. Ball, and great thanks were due to Mr. Epril and the Ball Committee for their hard work. Mr. Lobb reminded members that the date of the 1957 Ball would be 11 December, and he advised everyone to apply early for tickets, as they had sold out last year, and many had already been sold for this year.

The Society was very grateful to the technical press and to the Allied Societies' Year Books for the publicity they had given to its work, and also to the firms who took space in the *Red Book*, which was a great help.

He hoped all subscribers would try to interest their friends and persuade them to contribute, and he emphasised that the Society helped young people in distress as well as the elderly. If all architects gave 1½d. a day this would come to over £2 a year from each, and the Society would be able to give really substantial help, instead of having to dole out only a fraction of what it would like to give.

Mr. Goodhart-Rendel, in moving the adoption of the Annual Report, Statement of Accounts and Balance Sheet, said:—

'This is a great occasion, as now the word "go" has been given for starting work on the A.B.S. Homes. It is important that this should be a continuous enterprise, and we shall need more money so that we can complete the scheme. Both for the completion of the Homes and for helping those who apply to us we need more subscriptions. It is not a little more that we want, but a lot more. I am talking to the converted at this meeting, but we must all talk to the unconverted and try to bring in more subscribers. There is still such a large number who do not contribute anything, and those extra half-crowns which they do not yet send would make all the difference. We always follow a very careful policy with our investments, all our legacies and large donations being invested. We should like to have more to invest. We should also like to receive more Seven-Year Covenants, which so greatly increase the value of the subscription.

'We are very grateful to all those who give up their time to serve on our Council and Committees, and who help the Society in other ways; they are sharing in one of those works of mercy which are what life is for.'

The Annual Report, Statement of Accounts and Balance Sheet were adopted. A vote of thanks was accorded to the Honorary Treasurer, Honorary Secretary and Honorary Auditors, special mention being made of the enormous amount of work Mr. Lobb had done in connection with the Homes scheme, which owed a great deal to his efforts. It was agreed that all subscribers should be asked if they would try to find one new subscriber each, and that more publicity should be given to the fact that the Society helped young people as well as old. The Meeting closed with a vote of thanks to Mr. Goodhart-Rendel for having taken the Chair.

Review of Construction and Materials

This section gives technical and general information. The following bodies deal with specialised branches of research and will willingly answer inquiries.

The Director, The Building Research Station, Garston, near Watford, Herts.
Telephone: Garston 4040.

The Officer-in-charge, The Building Research Station Scottish Laboratory, Thorntonhall, near Glasgow.
Telephone: Busby 1171.

The Director: The Forest Products Research Laboratory, Princes Risborough, Bucks.
Telephone: Princes Risborough 101.

*The Director, The British Standards Institution, 2 Park Street, London, W.*1.
Telephone: Mayfair 9000.

*The Director: The Building Centre, 26 Store Street, Tottenham Court Road, London, W.C.*1.
Telephone: Museum 5400 (10 *lines*).

*The Director, The Scottish Building Centre, 425–7 Sauchiehall Street, Glasgow, C.*2.
Telephone: Douglas 0372.

Exolit Exsud Firestop. Like railway accidents, fires are evils that we do not think of as happening to ourselves, until we read of a fire such as that at the Jaguar works. And yet the Fire Protection Association states that more than 60,000 chimney fires occur every year and that they may spread to the rest of the house, or flying sparks set fire to surrounding property; therefore any material that is likely to prevent an outbreak of fire from spreading is worthy of consideration.

One of these materials is called Exolit Exsud Firestop, for which it is claimed that when applied to building materials such as timber, hardboard, acoustic board, insulation board, wood-chip board, plywood, etc., a coating of Exsud gives protection by creating a foam barrier layer when exposed either direct to fire or to the heat resulting therefrom. This claim is supported by tests carried out by the Fire Research Station, Boreham Wood; one test being made on fibre insulation board painted with the material, and the other test on acoustic board similarly treated. The result of the tests placed both treated boards in class 1, that is, having a surface of very low flame spread. It is also stated that the material has been tested and approved by the London County Council.

Exsud may be applied by brush, spray-gun or roller; it can be over-painted, and by suitable additions may be brought to a white or other finish. The concessionaires for the United Kingdom are Exsud South American Minerals and Products Company Ltd., of 26–27 Cowcross Street, London, E.C.1.

Mastic Asphalt. The merits and use of asphalt are known to architects; Codes of Practice give guidance on its application, and relevant British Standards are a guarantee of quality; yet there may be occasions when specialised knowledge would be of assistance, and in view of the wide variety of problems confronting architects in ensuring the waterproofing of buildings and in providing suitable floors the Natural Asphalte Mine-owners and Manufacturers Council have set up a free technical advisory service. The Council will also test, free of charge, samples of mastic asphalt cut from site or from blocks as delivered to site, for compliance with the appropriate B.S. and for determining whether the asphalt is natural rock or limestone. The Council also have specialised specifications not covered by a B.S., such as that for pithead bath flooring.

This advisory service is already dealing with more than 50 inquiries a month, of which the majority are from architects. The address of the N.A.M. and M.C. is 94/98 Petty France, London, S.W.1. Telephone, Abbey 1010.

The Delivery and Storage of Solid Fuel in Flats. On 9 May a conference was held at the Institution of Civil Engineers to discuss the report of an inquiry on this subject, conducted by a joint committee appointed by the London Regional Committee of the Coal Utilisation Council and the London Branch of the Institute of Housing. The chairman was Mr. Lionel G. Locket, and the speakers were Mr. Norman Carr, Mr. H. C. Hampton and Mr. Clifford Culpin [*F*]. The reason for the setting up of the joint committee was the feeling that present and foreseeable problems of delivery of solid fuel into flats on the one hand, and the increase in numbers of blocks of flats and in storey heights on the other hand, urgently called for joint consideration. The conclusions arrived at in the report have particular reference to London problems and therefore some may not be acceptable to persons in other parts of the country.

The report refers to the impact on individual fuel storage of smoke control areas to be created under the Clean Air Act 1956, since greater volumetric space is required for coke than for coal. Other points are that the layout of estate roads should permit close approach by the coal lorry to the entrance of the building, to reduce the total length of carry to the fuel store; the fourth storey (3rd floor) is the highest to which carmen should be expected to carry fuel upstairs; the minimum width of stairs and passageways should be 3 ft., increased to 4 ft. 8 in. at the point of delivery, and clearance to the ceiling should be 7 ft. 6 in.; additional storage at ground level to permit summer stocking of fuel is desirable, allowing storage within the flats to be reduced; storage capacity can be increased by raising the height of the delivery sill to 4 ft. 6 in.

The report discusses the possible use of returnable containers such as those used in Paris and known as 'jerricans', galvanised or painted, and holding about 40 lb. of small anthracite or 28 lb. of coke, but apparently they are used solely for the delivery of anthracite. Owing to the cost of these containers their use would result in appreciable additional cost of the fuel as delivered. The committee also considered reports on the delivery of fuel in non-returnable containers, such as double-thickness brown paper, as in Holland, containing about 18 lb. of anthracite. Experiments are in progress in England in selling coal in blocks wrapped in paper or cellophane, but again the cost is heavy.

In his paper Mr. Clifford Culpin asked why we should condemn some admirable man to hump heavy dirty coal up staircases and along galleries when district or central heating, or electric warming, is available. But, Mr. Culpin added, while costs remain as they are, it is cheaper—at least in the smaller schemes—to heat space and water by a single modern fire with a back boiler. To ensure getting the vehicle close to a block of flats the architect has to exercise particular skill if he is designing to the new pattern of layout in which closes and courts are created where only pedestrian traffic is permitted, vehicular traffic having to be arranged to approach the other side of the block. Mr. Culpin applauded the remarks in the report on packaging of fuel, although non-returnable containers normally mean more waste disposal; why not, therefore, make the containers themselves combustible.

Among points raised by speakers in the general discussion were: the use of paper bag containers would mean more frequent delivery; returnable containers would take up more room; small fuel stores indoors are unsuitable as it is difficult to get out coal lying at the bottom, apart from the question of dust.

Copies of the report may be obtained, free, from the Coal Utilisation Council, 3 Upper Belgrave Street, London, S.W.1.

The jerrican type solid fuel container

Ministry of Works Technical Booklets. As announced in the Editorial Notes of the April JOURNAL, the Ministry of Works have prepared seven booklets with the title *Technical Notes*, of which three had been published at the time the April JOURNAL went to press. The remaining four have now been issued, as follows.

Technical Note No. 4. **Ring Circuit Electrical Installations for Housing.** The foreword states that because of the increasing use of domestic electrical equipment more sockets than ever before are needed, and the booklet is intended to help the architect and builder to provide sufficient sockets to satisfy present-day needs at reasonable cost. It shows how by modern methods dwellings can be equipped with electric points on a generous scale at a cost per point far lower than when the usual meagre provision of points is made by traditional methods. The advantage is explained of the ring circuit for supplying power to all points other than those used for main lighting and cooking; sketches are given of typical electrical distribution layouts, and the fittings used with the ring circuit are described.

Technical Note No. 5. **Vibrated Concrete in Building.** This booklet, addressed to architects, surveyors and engineers, draws attention to the advantages of vibrated concrete as a building material and to the savings made possible by its use. Less cement is required in mixes designed for vibration than in those suitable for hand compaction. Vibrated concrete is more durable and less liable to shrinkage cracking, and there is greater certainty that design strength will be attained. An appendix gives the comparative cost of materials for hand placed and for vibrated concrete.

Technical Note No. 6. **Mix Design for Vibrated Concrete.** The booklet explains that the object of mix design is to produce a concrete that will compact easily to form a dense mass without excessive mortar, and in which the aggregates and cement are selected and proportioned to give the cheapest concrete having the required strength and durability. The three main factors on the site which affect a concrete mix are (1) the water/cement ratio, (2) the aggregates, and (3) the aggregate/cement ratio of the mix. Continuous grading, gap grading, and partial gap grading are described.

Technical Note No. 7. **Prestressed Concrete.** Reasons are given for prestressing, and pretensioning and post-tensioning are described.

Copies of these Technical Notes may be obtained from H.M.S.O., price 6d. each.

Fabric Partitioning. The tendency in designing industrial buildings is to provide as much flexibility as possible in the dividing of the internal space into separate compartments, so that re-allocation of the usage may be done with the least effect on the structure. If report be true Scotland has gone a long way towards solving the problem, for it appears that fire-proofed textiles are being used for the purpose. The material is a heavy sailcloth type of jute flax construction, of which the 24 in. widths can be joined to give an area 60 ft. wide and 50 ft. high. Brace units at roof and floor level, and cross struts, give the necessary rigidity. These curtains can of course be taken down and hung up again elsewhere with an ease that can hardly be approached by the most demountable of demountable partitions of the normal kind.

The Cleaning of Stonework. The Cathedrals Advisory Committee for England call attention to Volume 3, No. 1, April 1957, of *Studies in Conservation*, which is the Journal of the International Institute for the Conservation of Museum Objects. In it is a symposium of information on recent experience of washing the stonework of ancient buildings. The material was collected at the instigation of the Cathedrals Advisory Committee because it was felt that although a good deal of such work had been done in recent years, no attempt had previously been made to collate the results.

The article describes work done at Bath Abbey, Exeter Cathedral, Lincoln Cathedral, Romsey Abbey, St. Cross Church, Winchester, St. John's College, Oxford, Shire Hall, Gloucester, Wells Cathedral, and Westminster Abbey. The information given about each building is commendably arranged in the same order, under the cross headings of Position and Materials, Washing, Cost and Organisation of the Work, Reactions of the Public, and Notes on the History and Construction of the Building. The article is well illustrated.

The Cathedrals Advisory Committee are hoping to get reprints of the article with its illustrations; these will be obtainable from the Committee, at Fulham Palace, London, S.W.6, price 2*s.* 6*d.*, or 2*s.* 9*d.* if by post.

The Modular Society Ltd. At a recent Press conference the Modular Society presented a Policy Statement approved by the British Standards Institution and the Building Research Station. The Council of the Modular Society have been concerned at the lack of immediate progress due to want of agreement on policy concerning modular co-ordination, especially in relation to the size of the module.

Although in 1954 the Council adopted a 4-in. module on a provisional basis for their own work, subsequent experience here has made it apparent that in an important part of the building industry—namely that part which uses brickwork as its prime material and does so mostly in housing, flats or building of a similar scale—a 4-in. module is not likely to be immediately acceptable. The common British brick is not related in any simple way to a 4-in. module, and while this does not present serious difficulties on large buildings it does to a greater extent on smaller ones.

It is hoped that clay products of modular dimensions will be developed and support will be given to such work, meanwhile 'The Council will continue to recommend that a 4-in. module be adopted as the basis for future building, Standards and Codes of Practice associated with it, but that also for the time being the brick size should be left much as it is and the sizes of components intended for use in housing or similar construction in brick should continue to be related to the size of the brick'.

Asbestos Cement Rainwater Head. The publication of B.S. 486: 1956 on asbestos cement pressure pipes emphasises the use being made of asbestos cement products, including cisterns and gutters and downpipes, and now a new rainwater head is announced by the Universal Asbestos Manufacturing Company Ltd. As it is not essential to paint these rainwater products, the painter is relieved of the job of painting the back of them, which, of course, he so conscientiously does if the pipes are of metal.

The new head is rectangular in plan and section; it has a narrow rim at the top and a raised hexagonal panel on the face. The overall width is 12 in., the height 6 in. (exclusive of the outlet), and the depth is 6 in. The outlet sizes are 2 in., 2½ in. and 3 in., the list prices being respectively 7*s.* 3*d.*, 8*s.* 10*d.* and 10*s.* 5*d.* The address of the U.A.M. Company is Tolpits, Watford, Herts.

British Standards Recently Published

B.S. 486: 1956. **Asbestos Cement Pressure Pipes.** Increased availability of asbestos, and improvements in qualities, have made it possible to specify a reduced wall thickness for asbestos pressure pipes, while still retaining a high factor of safety.

For simplification a single thickness has been standardised in the smaller diameters for more than one class of pipes; thus in the 2 in. diameter pipe the thickness is the same for all four classes, and for the 3 in. diameter it is the same for classes A and B and for C and D.

Connecting devices have been dealt with in greater degree than before, and requirements for any form of rubber joint ring are given, also those for a suitable coating solution for both pipes and jointing collars. For the first time metric tables are given in addition to the inch measurements for the thickness and the external and internal diameters. This may assist overseas buyers. Price 4*s.*

The R.I.B.A. representative on the drafting committee was Mr. J. R. Harris [*A*].

B.S. 2855: 1957. **Corrugated aluminium sheets for general purposes.** This Standard has been published in response to a request from the Aluminium Development Association, as these sheets are increasingly used in building as roofing sheets and for other purposes. The Standard sets out specifications for corrugated aluminium sheets in two widths of 8/3 in. and 10/3 in. corrugations respectively.

The Standard does not include details as to the use of these sheets; recommendations on their use for roofing will be the subject of a Code of Practice now being prepared. The price of B.S. 2855 is 3s.

The R.I.B.A. representatives on the drafting committee were Mr. D. W. Aldred [*F*] and Mr. R. M. V. Messenger [*F*].

A New Construction for Areas Liable to Subsidence

IN THE PAST the country has usually adopted the well-known precautionary measures of providing substantial foundations and articulating the building. Even with these costly precautions damage has frequently occurred and considerable expense been incurred. Sometimes, because of their dangerous condition, parts of buildings have had to be closed temporarily.

In a new attempt to overcome these problems, the Nottinghamshire County Council has undertaken a programme of research and development, with the co-operation of the Building Research Station (D.I.S.R.) and the National Coal Board.

Bearing in mind that the principal factor affecting the stability of buildings is the elongation of the ground surface when subsidence occurs (in the Nottinghamshire coal-field this amounts to a maximum of about 4 in. in 100 ft.), the basic conception in the present development is that buildings should be constructed above the ground with a layer of such material between the ground and the foundation slab that horizontal movement will not be transmitted to the structure. In addition the structure needs to be as light as possible to keep the frictional force between the 'sliding' layer and the ground to a minimum, and of pin-jointed construction to enable the building to adjust itself to differential vertical movements.

The new schools will be built on ground which has been levelled, and the foundation slab, of 5 in. reinforced concrete, will be cast on a layer of shale, with a sand topping, compacted to give a level surface, the coefficient of friction between the slab and the sand being taken as two-thirds.

The superstructure consists of a steel frame with 4½ in. square columns made of two cold-formed channels welded together. The beams are of light-welded latticed construction 18 in. deep, which facilitates the distribution of services in addition to providing the necessary strength in bending. Lateral stability is provided by diagonal bracings in the vertical plane between the columns at selected points in the structure, assisted by the floors and roof (1½ in. tongued-and-grooved boarding). The bracings themselves are unique in that each member has coiled springs housed at its ends in such a manner that sway or lateral distortion is always resisted by one of the springs acting in compression; the other spring remaining inoperative at the time.

The columns generally are set on dowels fixed to the centre of square bearing plates bedded into the concrete slab. The corner stanchions have single holding-down bolts in place of dowels. The beams are shaped like warren girders so that only the top flanges connect to the columns. These connections are bolted and are designed to give flexibility.

The cladding is of a type which will permit movements of the magnitudes envisaged, e.g. hanging tiles, or concrete slabs, or weather boarding. Window frames are of timber, the panes being undercut more than usual. Tests have shown that, by their special design, these can suffer the maximum anticipated distortions without serious damage and they overcome the danger of flying glass. Steel window frames are not suitable for a flexible structure of this type.

The only work below ground level is the drainage system. Flexibility in this is provided by the use of pitch fibre pipes with long joints. Connections to w.c. pedestals are made with short lengths of flexible plastic piping (which can easily be renewed), and cast iron elbows.

The school buildings have been planned on a modular system in both horizontal and vertical directions. This has helped considerably in standardising components and in keeping costs down. It is claimed, in fact, that these schools, with all the precautions taken to prevent or alleviate damage due to subsidence, will cost no more than equivalent traditional schools in non-mining areas.

The first of these schools, now being built at Mansfield, is of single-storey construction, but others are planned up to three storeys. The National Coal Board is collaborating with the County Council in obtaining data on movements both below the ground and of the building; and some subsidence is expected within about six months of its completion.

Correspondence

GUILDFORD CATHEDRAL: THE ARCHITECTS' WINDOW

EDITOR'S NOTE.—The letter printed below was addressed in the first instance to members of the South Eastern Society of Architects. It is, however, so worded as to include in its appeal the whole membership of the Royal Institute, and it is hoped that there will be a wide and generous response.

DEAR MEMBER,—The building of a new cathedral gives an opportunity of service that can happen only rarely in the lives of men.

The design of Sir Edward Maufe, R.A. [*F*], for Guildford Cathedral was chosen in the Architectural Competition held in 1931, but its building has taken all too long. Delays were caused by the war and the difficult years that followed.

The chancel, crossing and transepts of the new Cathedral are complete with their internal finishings and a great effort is being made to complete the seven bays of the nave during 1958.

The Cathedral Authorities have a planned conception for raising funds for the nave whereby the professions, services and other bodies shall each be represented by giving one of the windows together with the structure surrounding it. Several of these windows have already been bespoken by the professions concerned. We have been invited to contribute an Architects' Window. This is an honour that we cannot fail to accept.

The tall, slender windows will be glazed with plain glass and we are told that the Badge of the Profession may be incorporated at the foot of the window where it will be readily seen from the nave and will be the only bright colour in the window.

Much has been said about putting the profession on the map from a materialistic point of view, but here is our chance to do so spiritually for many generations to come.

Architecture is raised above mere building by the spark of creative genius which our Creator gives to each one of us. We, of all the professions, should give thanks for this precious gift and should be ready to raise up our offering to the Glory of God. This is not a charity. It is a thank-offering and an affirmation of our faith.

We are appealing for the sum of £2,000, which is the estimated cost of the window and its surrounding structure.

It is confidently hoped that this appeal will be generously supported not only by *every* member of the Society, but by all other architects who may wish to be associated with this great effort.

Donations, whether large or small, will be very welcome. Such donations should be sent either to the Treasurers of the several Chapters of the Society, or to the Hon. Treasurer, The South Eastern Society of Architects, 20 Dudley Road, Tunbridge Wells, Kent, cheques to be made payable to the Hon. Treasurer, The South Eastern Society of Architects.

(*Signed*) R. DUNCAN SCOTT [*F*],
President:
South Eastern Society of Architects

PETER MCG. CORSAR [*F*],
President:
Hampshire and Isle of Wight Architectural Association.

PLANNING PERMISSIONS

The Editor, R.I.B.A. Journal

DEAR SIR,—I believe a marked improvement in the quality of our suburban development and of our villages and countryside would be brought about if all the plans of buildings and structures which are required by statute to be submitted to a local authority for approval under building bye-laws or for planning permission were required also to be endorsed by an architect.

I have it in mind that where plans are not prepared by an architect in the first instance it should be a preliminary requirement to their submission that they should, in effect, be certified by an architect as being competently prepared. There would be a scale fee for the architect's endorsement—based on an assumption that the plans would need considerable revision and redrawing to bring them up to the archi-

tect's normal standard—and I venture to think that when members of the public found they could not get cheap plans as they cannot get cheap conveyances they would as readily bring in their properly qualified designer straight away to their building process—and to their advantage—as they now bring in their properly qualified lawyer.

A very large part of new building work (in the numbers and dispersal of separate building units) is built to plans not prepared by architects. Plagiarism is rife; but in the process the essentials of siting, proportion and detailing are often lost.

It seems to me that the present control of the appearance of buildings by the planning authorities is not to be despised, and that the general view expressed by Mr. Theo. Crosby in his recent letter to you is to be deplored. Until the architectural profession can itself exercise a broad control over the quality of design it is a good thing, in my opinion, that the need for control should be recognised and the power exercised. The planning committees with, in many instances, their panels of architects, do a very reasonable job in a very reasonable way, and the designer who feels that his design has not been properly appreciated locally can appeal to the Minister. Surely that is fair enough. Surely that is a sufficient safeguard against the tyranny of the Council.

A number of poor designs—some from the drawing pens of architects—receive planning permission because the general level of design and the general level of appreciation of design is not high. I believe that would be remedied in large part by focusing the attention of the man in the street on the practical necessity of good design.

Yours faithfully,

W. T. JEFFRIES [*A*]

County Planning Officer
to the County Council of
the Soke of Peterborough

COUNCIL ELECTIONS

DEAR SIR,—May I draw your attention to a result of the altered method of electing the Council which I feel sure was largely unforeseen?

Under the old system, every sophisticated voter realised that the fewer the number of X's he placed on the voting paper, the greater the value of a single X to the candidate of his choice. In other words, a carefree filling-in of the maximum number of votes permitted could, and one suspects sometimes did, lead to some unexpected results. The effect of this (probably inevitable) defect of the system was mitigated however by the division into watertight classes: if one cast a vote for JONES (Licentiate), one knew one was not prejudicing the chances of BROWN (Fellow), nor those of SMITH (Associate). One had three votes, each of the maximum value.

Now all this is changed. The new 'floating' class of members effectively abolishes the barrier. And if one specially wants, say, ROBINSON (Fellow), to be elected it is unwise to place more than a single X upon the paper. This seems to me a most regrettable development.

Yours faithfully,

HUGH P. CRALLAN [*F*]

Making an Income Secure

THE PROFESSIONAL MAN as a matter of course makes sure that his house and its contents are adequately insured. He usually makes provision for the education of his children and for his family in the event of his premature death, with a pension for himself on retirement.

All this provision depends entirely on his ability to continue at work and so earn an income. In the event of disablement, how long will his income continue? Probably for a limited period only, after which the plans of a lifetime may have to be abandoned and savings gradually depleted. Good health is the basis of present achievement and future progress. It is simple common sense to make certain that illness or accident does not endanger the plans and prospects of the professional man and his family.

Continuous Disability Insurance secures an income as no other safeguard can. Like a Life Assurance Policy (and unlike policies which are issued for twelve months only on the annual contract basis) the Insurance Company cannot decline to renew the Policy prior to the normal expiry date—usually age 65. No matter how many claims are made, the cover provided under the Policy cannot be restricted nor can the premium be varied.

The income secured by this Policy is payable so long as disablement continues up to the pre-selected date for the expiry of the contract. The records of the Insurance Company show cases where incomes have been paid to a policy-holder for more than 20 years without a break—including cases of epilepsy—tuberculosis—paralysis—poliomyelitis—mental disorder—though when his Policy was taken up each claimant was in good health.

With such cases in mind the weakness of a year-to-year policy with its limit of 104 weeks' benefit stands out clearly. While it is only too true that a Continuous Disability Policy can neither entirely remove nor ward off illness and accident it can give that freedom from anxiety which is so much to be desired and so helpful in the time of disablement.

This is not a new class of Insurance: it has been transacted since 1885 and policies are being issued on an ever-increasing scale to men engaged in professional and business activities. An admirable feature of the scheme is that it is subject to periodical actuarial investigation in a similar way to Life Assurance. It thus stands on an unassailable scientific basis, while the accumulated funds under such a scheme provide the necessary reserve for the substantial liabilities involved.

The premiums payable are not high. A Policy can be arranged to provide benefits from the first day of disablement: lower rates of premium are allowed where benefits begin after disablement has lasted one month or three months. Such Policies would cover serious illness or accident, while the exclusion of short periods of disablement reduces substantially the rate of premium payable. The A.B.S. Insurance Agency, Ltd., has made arrangements whereby attractive terms are offered to Architects taking up Policies under this unique but well-tried scheme. Inquiries addressed to the A.B.S. Insurance Agency, Ltd., 78 Wimpole Street, London, W.1, will have prompt and careful attention.

Book Reviews

Shops and Stores to-day, by *Ellis E. Somake and Rolf Hellberg*. 9¾ in. 231 pp. incl. pls. London: Batsford. 1956. £3 3*s*.

This is one of the best books yet published in this country on the design of shops and stores. For one thing it deals with multiple stores and, as far as I know, is the only post-war book published in England that does.

It covers a wide range; from department store to dry cleaner; fashion shop, food shop, chemist and confectioner; the hidden romance forcing its way through the down-to-earth, clear, factual, if not always elegant, prose.

The extraordinary thing about this book, written by two well-known architects, is the refreshing way it 'plays down' the architecture. It is full of fascinating shop specialist jargon.

Messrs. Somake and Hellberg are obviously enthusiasts—enthusiasts of the really ageless sort like vintage motor-car enthusiasts—completely and unself-consciously wrapped in the spell of their own specialist technical knowledge. One is amazed to learn that . . . 'strategically placed, even an expensive article like a car can become *impulse merchandise*'—the italics are mine. Words like 'emphasis spots' or 'hot spots' (as they are known in America), 'demand articles', 'convenience merchandise' pop up startling and descriptive throughout the text. One is made aware of the intense pressure that is directed at the unsuspecting consumer who swims, like a hypnotised goldfish, through the entrancing maw of the entrance, into the seductive interior; dreamily past the 'impulse merchandise' then the 'convenience merchandise' to the 'demand articles' at the back, and slowly, sated, past the 'convenience merchandise' again, and then, not too sated perhaps to make a few 'impulse purchases', out once more into the swirling street.

The whole technique is beautifully and succinctly summed up in the first paragraph of chapter eight, 'The Interior.' I quote . . . 'This is the basic rule behind the planning of any shop, however large or small. Impulse goods in the foreground, demand items to the rear, convenience

merchandise between; selling space forward, customer facilities variable, but with a long approach, and staff and stock rooms well out of the way.'

But I dwell too long on this single fascinating facet, when each one is dealt with in detail. There are specialist chapters by experts: an excellent chapter on the shopping centre by Frederick Gibberd (. . . 'Gossiping over the shopping basket is an important social function'), chapters on display, illumination and mechanical services. Here, for instance, is described a most interesting air-curtain doorway, in which customers enter the shop through what is virtually a ventillation duct. Filtered and heated air is blown down through ceiling louvres and extracted beneath the customers' feet. 'Heat loss is said to be only 25 per cent, which would be lower than most doorways, even when lobbied.'

There is a good chapter headed 'Realisation', which deals with all the stages from the preliminary design to the day the building is handed over. This chapter includes a timely plea to clients to make haste slowly. The book ends with a useful series of technical appendices.

A word about the format. In my view the criterion for this type of publication is still Alfred Roth's book, *The New Architecture*, published in Zürich in 1940. It is unsurpassed in its presentation of drawings and photographs with a semi-technical text. But do not be put off by the vulgar dust jacket and plump pages of *Shops and Stores to-day*. The photographs are well chosen, the drawings and diagrams are clear and it is, as they say, 'a mine of information'.

LEONARD MANASSEH [*A*]

Town-Building in History, by *Frederick R. Hiorns*. 9¾ in. 443 pp. incl. illus. Harrap. 1956. £3 5*s*.

Architects' responsibilities have to range from Trajan lettering to polyesters. Town building is one which they are well qualified to assume with their long planning tradition. Why, then, the general bloodless state of our revived urban development? Does the joy and inspiration dwindle as the sociologists, statisticians, zoners and road planners increase? Cynicism is unhelpful, though over-preoccupation with such technics at the expense of vision and imagination is a likely contributory cause.

The book is a good corrective for this state of mind, since it deals with the past fifty centuries, with only minor parts concerning recent times. With over 500 illustrations, one first expects to find a 'Banister Fletcher' of town history. It is actually quite a limpidly written account, sufficiently interesting to seduce a reviewer from skimming through it. From the towns of deep antiquity, with some evidence of water and drainage systems and many-storied dwellings, to the magnificent squares and terraces of the Age of Reason, via the Classic stage, 1,000 years of dormancy, Mediaevalism and the Renaissance, the author's treatment calls for no particular comment.

Perhaps outstanding is the extent and quality shown of mediaeval urbanism in Europe, and less so in Britain, if one overlooks the neglect of sanitary principles. Mr. Hiorns considers that harmonious appearance became intuitive in this period. One timely exemplar is the historical treatment of civic places: such as Pompeii, Bruges, Siena, St. Marks, Nancy. An evaluation of them seems useful, if we are to capture any spirit in our town centres. Architects, except those who have inhibited their Classical libido, will appreciate the careful Vitruvian-Renaissance section. Also the late Georgian and Regency one, with good illustrations reinforcing the author's evident admiration. This has led him to a conclusion, which will most certainly be opposed, that neo-Georgian should be the present basis of design.

If the sections with opinions on the present had been omitted and the book confined to factual history, there could be little criticism. Every eligible town is included in this extensive treatise, but even greater than its reference value is its merit as an antidote in the technological age. Campaigners against urban uglification should also find it of service. It suffers slightly from lists of worthy, but dispensable, quotations and some minor errors in indexing, but it has a high quality and is a noteworthy work.

JOHN CUNNINGHAM [*A*]

James Wyatt, by *Antony Dale*. 9 in. (10) + 228 pp. incl. 24 pls. and other illus. Oxford: Basil Blackwell. 1956. £1 10*s*.

In 1783 William Conyngham travelled to Portugal, visiting the Monastery of Batalha, and bringing back with him some sketches that must have been seen by James Wyatt when designing Shane Castle for Conyngham in 1784–85. These sketches inspired James Murphy's visit to the Monastery in 1789 and his publication of a book in 1795, which may well have had an influence on the Gothic revival in England comparable with that of Stuart and Revett's *Antiquities of Athens* on the Neo-Greek Revival. Wyatt's Lee Priory is a child of the Mausoleum of King John of Batalha, as were also the early designs for Fonthill Abbey. The archaeological correctness of Lee Priory was the unwitting death-knell to Strawberry Hill Gothick, foreshadowing the more serious scholarship of the coming century. It belonged in spirit to the one, and in fact to the other, attitude, reflecting in little the nature of James Wyatt's architecture. Possibly by filling the gap in our knowledge between Wyatt's return from Italy in 1768 and the designing of the Oxford Street Pantheon in 1772, we could solve the enigma of his early career. The two opposing Schools upon his arrival were those of the Adam Brothers and Sir William Chambers. Wyatt seems to have picked the bones of both of them and, although associated with the Adam School, much of his work suggests sympathy with Chambers's monumental Romanism. The contribution of Wyatt to interior decoration was to dismember the elements of the prevailing Adam style and to reassemble them in a more refined context with an admixture of sharply defined Greek ornament. In his exteriors he produced an almost Greek quality by the severity of line and the skilful contrasting of unornamented wall with simple window openings. This phase culminated in the austere and chaste Dodington.

In his revised biography, Mr. Dale does not provide any new important information about the architect or his work. Rather he states the known facts and adds some recent material, collected chiefly from family letters. The chapter on the cathedral restorations is still the most useful contribution, and Wyatt emerges from the assessment absolved in our minds from many of his alleged misdeeds. Omissions are a failure to analyse seriously Wyatt's style; to place him in the perspective of his contemporaries; to assess his influence upon his family. James's neutral classicism cannot be disassociated from that of his brother Samuel, and his Gothic work was greatly to influence his nephew Jeffry Wyatt, notably at Windsor Castle.

The illustrations are too small and are not enough for an understanding of the text. With two exceptions no ground plans are given. Plate 28 of the staircase at Stoke Park shows a late 19th-century reconstruction, as is also to a limited extent much of the exterior of the house. It does not accord with Basire's engravings of 1813. Plate 30 of Goodwood shows the front of the house, the centre of which was designed by Sir William Chambers in the 1750s. New Park and Roundway House, Wilts, have been treated as separate buildings, whereas they are one, designed in 1780. Bulstrode Park, Bucks, was not completed by P. F. Robinson, but remained in a ruined state. Both Belmont and Winnington Houses, Cheshire, are by Samuel Wyatt.

J. H.

Sixty Post-War Churches, published by the *Incorporated Church Building Society*. 9 in. 120 pp. incl. illus. 1957. 10*s*. 6*d*.

Illustrations of 28 consecrated churches are included in this small, useful and well-produced book; and 32 buildings of various types, such as churches built as part of an integral scheme, church centres, and dual-purpose buildings used for both religious and secular meetings. The cost is given in each case, ground plans are shown and very brief notes are provided on accommodation and construction. D. F. Martin-Smith [*F*] explains the architect's viewpoint in an introductory article and R. J. McNally refers to some of the problems of planning dual-purpose churches.

One often hears that a church is the hardest of all buildings to design. Alas, it is all too clear that some of the architects whose works appear on these pages have been completely stumped by the problem.

J. C. P.

Building Elements, by *Richard Llewellyn Davies* and *D. J. Petty*. 9 in. 384 pp. incl. illus. Architectural Press. 1956. 37*s*. 6*d*.

This is a book which students, and most architects and assistants, should go through carefully. It is, to quote the blurb, 'the third and final volume to appear in a series of three which has been published at the recommendation of the Text and Reference Books Committee of the R.I.B.A. The previous volumes were *Building Materials* and *Structure in Building*, which with *Building Elements* now combine to provide a thoroughly comprehensive up-to-date work on modern building construction. The present volume deals with the structural elements of which a building consists—walls, floors, roofs, windows, doors, etc.—and explains the functional requirements which a building has to meet: it then describes how far, and in what way, these requirements are met in the actual design of these elements.'

The aim of this series is wholly admirable. Do these three volumes cover the field envisaged? It is a very large field, most of it never before attempted in this way, the function-design-choice way of the architect, so it is hardly surprising that there are many gaps, some considerable in size. Where are for instance semi-structural elements, such as curtain walling? The book here reviewed has only a very brief mention of this. Asphalt and bituminous roof coverings are a big problem now, particularly on roofs such as decking or light-weight slabs. The materials are well described in Handisyde's volume on materials, but not the application. In this volume the application is described briefly with some very useful factual information, weights and quantities of felt, etc., but the whole complex story of making such difficult choices, price versus quality, degree of insulation necessary, how far one should go with expensive methods of avoiding condensation, cannot be told in the few pages here allocated to this subject. In fact the chapter on roofs shows well the very considerable task the authors have taken on, what a lot they have achieved and, sadly, how some of it is too general to be really valuable, and how some aspects cannot be included at all—special aspects, perhaps, but ones which are increasingly worrying every architect, such as defects in felt roofing. In this chapter we get: loading on roofs, rainwater disposal, heat insulation requirements, roof forms in relation to planning requirements and aesthetic considerations, structural systems in timber, pitched and flat including purlin and truss systems, timber jointing, most traditional coverings including metal sheet, decking systems, and impervious finishes. All this in 69 pages, which include 54 drawings and photographs.

Again an admirable chapter on windows has very valuable paragraphs on daylighting measurement and natural ventilation, but little on the limitations on the sizes imposed by material itself and by jointing methods available at present—a very important aspect, virtually ignored by most architects and schools at the present time. Eastwick-Field and Stillman's coming book on joinery will deal with this very thoroughly, if the articles in the ARCHITECTS' JOURNAL give a true indication of what will be included, but that book when it comes will not officially be one of the series.

These are criticisms of the series and of omissions from a book already some 380 pages long, with nearly 200 drawings and well-chosen photographs. Perhaps it is rather carping criticism, because, for those seeking a really sound, balanced picture of constructional knowledge and techniques at the present time, this book will be invaluable. It brings in everything relevant, even if you have to go somewhere else for more detailed analysis or practical example. References and codes, bye-laws, B.S.S., all seem to be there, and the boiling-down of some of the more verbose codes is masterly. Many architects now and most students leaving schools are aware of the principles, and for a special case are willing to wade through the appropriate codes for the necessary data and its method of application, but for general purposes short simple statements and concise data are wanted, and here they are.

Some of the traditional examples are a bit of a surprise in a book with such a scientific and contemporary approach. King and queen post roof trusses may be useful for comparison, but the space might have been better used for examples of good contemporary work. This book is not a constructional encyclopedia or an exemplar like Mitchell or McKay, and whether it can replace those as the first on the new student's school book list (technical) remains to be seen, but every student should sometime acquire a copy and most architects would do well to do so too.

DENZIL NIELD [*A*]

The English Cathedrals. Photographed by *Herbert Felton* and with text by *John Harvey*. 2nd ed.: by *John Harvey*, illus. from phots. by *Herbert Felton*. 8‡ in. 192 pp. incl. pls. and other illus. Batsford. 1956. £1 5*s*.

A second edition so soon after the first (1950) speaks well for this book's popularity. There are notable small variations. The illustrations are now fine-screen halftones instead of photogravures (not necessarily an improvement, as the latter have a value and charm of their own); the old photographer's (characteristic) foreword is missing; the text is re-set in a larger size and different type-face. A map of England has been added; there are 7 more plans, 3 pages more of the (very useful) historical and descriptive notes on each cathedral, giving dates of building and restorations, one page more of the fascinating descent of architectural features (vaults, fronts, towers, chapter-houses, and cloisters) and of the index; there are now a glossary and list of sources. Dedications would be useful; the Norman survivals at Southwark (1106) and north cloister at Westminster (1260–69) are omitted. The author has 're-examined the fabrics of all' except three cathedrals. Parish-church cathedrals (so far poorly documented) and the 19th–20th-century examples are professedly excluded; perhaps we shall see them in a third edition. Altogether a remarkable combination of a scholarly summary and a well-illustrated presentation volume. H. V. M. R.

School Planning and Building Handbook, by *N. L. Engelhardt, N. L. Engelhardt, Jnr.*, and *Stanton Leggett*. 9 in. xiii + 626 pp. New York: Dodge Corporation, 1956. $12.75.

The book is a comprehensive survey of the complicated process of establishing new schools under the existing system in the U.S.A., where the financing, planning, erection and running of schools is the responsibility of well over 80,000 School Boards. The type of building provided and the amount of money spent on it depends almost entirely on their efforts, since no federal grant system exists at present and state aid seldom represents more than about 30 per cent.

The School Boards are comprised largely of laymen, who must seek advice from specialists, such as the authors, who have a nation-wide practice. They are known as Educational Consultants and their qualifications would seem to embrace those of the sociologist, town-planner, educationalist and, to a lesser extent, the architect and surveyor. They draw up development plans for the area under the jurisdiction of the Board, advising on selection of sites in relation to population and industrial trends, and prepare the architect's brief; functions which, in this country, are carried out by permanent salaried officials.

From the architect's point of view, there is relatively little in the book in the way of general guidance on school planning and what there is, is not supplemented by illustrations. In the American manner, there is a marked preference towards tabulation of information, ranging from checklists of accounting and possible legal problems, as well as for an architect's qualifications (the first question is 'Does he know his business?'), to what records to place in the foundation stone and rules of personal conduct for the clerk of works. There is a deadpan obviousness about many of the items in the 53 schedules and checklists which, on this side of the Atlantic at any rate, would be considered a reflection on the intelligence of the School Board members.

Of necessity, finance looms large, but it is surprising that the two chapters on building costs are confined mostly to comparing the merits of various yardsticks. The most favoured is the one with which architects in this country are most familiar—cost per foot super. With the vast regional differences in budgets, climate and, to some extent, in building costs, in the large continental area of America, the close control over cost that is operated here is hardly feasible. Yet cost analysis and cost planning, which would go a long way towards establishing control, get only a passing reference; and even that stresses the difficulties rather than the advantages.

R. CASTLE CLEARY [*A*]

Oscar Niemeyer: Works in Progress, by *Stamo Papadaki.* 9 in. 192 pp. incl. illus. New York: Reinhold Publishing Corpn.; London: Chapman & Hall. 1956. £4.

Stamo Papadaki's second volume on Oscar Niemeyer's work is again full of beautiful photographs and drawings. In fact there are 350 illustrations covering 30 examples of 15 building types, including his Museum of Modern Art in Caracas. So great is the range of his works that one wonders to what extent they may be representative of Brazilian architecture today. They cannot be said to be other than international in style, even though, as Niemeyer himself points out in his interesting foreword, they stem from improvisation and the personal economy of individual clients, rather than from problems of a general building economy as it exists in Europe.

His buildings and projects yet to be carried out are wonderfully imaginative, fresh and stimulating. The flowing line in concrete and the free uninhibited design spring also from the technology and art of the pioneers of the modern movement. The freedom with which he contrasts, in the most striking manner, the firm lines of the machine-age style with rugged and almost virgin surroundings, for example, is more the action of a pioneer settler in a new world than one who reflects local or national characteristics. The motivating forces of the mind that have produced them have yet to acquire a patina from the country itself, and from the new civilisation as it grows older. For, as he points out, the great variety of forms in Brazilian architecture is due to the lack of any effective social and economic basis, and the absence of a large building industry with prefabricated assemblies and parts. One could also imagine an absence of local authority regulations built up from years of mature experience of the older countries!

His reinforced concrete creations are not all products of these conditions. The repetition of parts in many of his designs, for instance, bear the imprint of standardisation technique, and thereby show yet another influence from older civilisations. In fact there would seem to be a certain illogicality in his introduction of a machine age style into a country so young in industrial development. On the other hand, his handling of a problem in virgin country, as, for example, his Cavanelas house in Pedro do Rio, shows a fine sensibility to the surroundings in its tent-like structure of framed roof supported by local stone piers. Here he has come to terms with his setting and is not defiant, as in some of his other projects. Altogether, this is a stimulating book and helpful in rejuvenating the mind overcharged with regulations and tradition.

DEREK PLUMSTEAD [*A*]

The Building of Malta, by *J. Quentin Hughes.* 8½ in. xiii + 242 pp. 332 illus. Tiranti, 1956. £2 2s.

Nowadays the military do not have a good reputation as patrons of architecture. Their buildings often deface the past and invariably disfigure the present. It was not so in the Middle Ages, when castles were things of beauty designed for visual prestige in peace as well as for defence in time of war: nor were the military engineers of the 17th and 18th centuries devoid of aesthetic ambition. In England, it is true, there is little military architecture of the Vauban period to admire, but on the Continent, and above all in the Mediterranean island of Malta, the fortified towns of the past are full of architectural interest. In Malta, indeed, there would be little enough to see, were it not for the Knights of St. John who made it their citadel for over 250 years. When they arrived in 1530 they found Valletta a barren rock; when they were expelled by the French in 1795 they left it a place which, to quote Disraeli, 'equals in its noble architecture, if it does not excel, any capital in Europe'.

It is the building of Malta between 1530 and 1795 which is the subject of Dr. Hughes' book—a book of which both the island and the author may be proud, for it will be long before it is superseded by a better. Though of modest format and less than 250 pages in length, it contains a comprehensive survey of all the major buildings erected in the time of the Knights, with full bibliographical references, critical comment, and ample illustrations, including a large number of excellent plans and elevations drawn by the author himself. One of the great merits of the book is that it is written by someone who has a wide knowledge of European architecture, so that he is able both to determine the outside influences—Roman, Spanish, Apulian and French—which have made themselves felt in Malta, and to isolate those elements which are characteristically Maltese—the lateral screen walls which disguise the cruciform planning of the churches, the fat 'Melitan' mouldings, and the resistance of the local masons to the more extreme manifestations of the baroque as understood in Southern Italy. The way in which the native masons responded to the architectural opportunity offered by the Knights is, indeed, one of the more surprising things about Malta's architectural history, for, apart from the Library of the Order, no important building in the island was designed by a foreign architect during the period of their rule, and the architecture of Valletta itself is dominated by the works of Gerolamo Cassar, the Maltese architect of the Magisterial Palace, the Conventual Church of St. John, and of the seven auberges in which the Knights lived rather like the Fellows of an Oxford or Cambridge college. The result is to give an unexpected consistency to Maltese architecture which is rightly emphasised by Dr. Hughes in his concluding summary. The buildings themselves are described in two long chapters, one on ecclesiastical, the other on secular, architecture. Both historically and architecturally they are models of their kind, and the numerous plans and elevational drawings enable the reader to verify every important point for himself. On details of structure and building technique Dr. Hughes is no less well-informed, and the careers of the Maltese architects are outlined in a useful appendix.

For anyone visiting Malta for the first time this, then, is the perfect architectural introduction; compact, concise and comprehensive. But no architectural historian can read it without profit, for it sets a standard of presentation and exposition which puts to shame many a more pretentious work, and at 42*s.* it is a book for which its publishers are asking a remarkably moderate price.

H. M. COLVIN [*Hon. A*]

The Theory of Prestressed Concrete Design: Statically Determinate Structures, by *Henry J. Cowan.* 8¾ in. xvii + 264 pp. text illus. Macmillan. 1956. £1 16*s.*

Professor Cowan's book is intended primarily for structural engineers, and assumes a knowledge of mechanics and an 'elementary' knowledge of mathematics. After chapters on the principles and manufacture of prestressed concrete and the properties required of the steel and concrete used, the author describes, with worked examples, how to compute such things as loss of prestress and ultimate strength. He is concerned with direct design, rather than the checking of an existing or assumed structure.

Antique Locks. From the collection of Josiah Parkes & Sons Ltd. ob. 8¼ in. × 10¼ in. 43 pp. incl. illus. Josiah Parkes. 1955.

The greater quantity of an article that can be produced (13,000,000 fittings annually in the firm's factories), the less value a utilitarian age attaches to each individual item; but old examples, such as those from the same firm's museum illustrated here, appreciate enormously in value.

Early locks with their keys can be divided constructionally into moving parts and security mechanisms, or into cases, escutcheons and method of attachment to doors and lids of chests. Both aspects are dealt with here, but whereas the mechanical system is shown with each example (and anyone wishing to find out more about boxes of wards, keys, bolts, springs, tumblers, Barron's patent of 1778 or the mathematical aspects of differing, should be referred to the relevant sections of the same firm's *Locks and Builders' Hardware,* published in 1948), the second aspect is not systematically treated in its relation to ironwork and metal work generally.

The assembly of parts, each of its proper material, wrought iron, cast iron (the grey variety), or steel into a block of wood which served as the lock case, is illustrated in the so-called 'Banbury Locks'. Examples of cases in sheet-iron (the use of which by locksmiths goes back to the 13th century) characteristically elaborated are shown, while the unornamented English 18th-century set of iron locks in brass from Pendeford Hall is noteworthy in a different material. Only one of the examples, the brass-cased rimlock, bears the maker's name.

In all cases the dimensions of the locks illustrated are given. A most interesting book.

C. J. SEARLE [*A*]

Notes and Notices

NOTICES

Session 1956–1957. Minutes XII. At a Special General Meeting held on Tuesday 21 May 1957 at 6 p.m. Mr. Harold Conolly, C.B.E., Vice-President, in the Chair.

The Minutes of the Special General Meeting held on Tuesday 7 May 1957 were taken as read, confirmed and signed as correct.

The Chairman stated that this Special General Meeting had been called for the purpose of confirming the Resolution passed at the Special General Meeting held on Tuesday 7 May 1957 concerning the Council's recommendation for the acceptance of the offer of Mr. H. G. Wicks, M.C., T.D., [*F*], of £14,000 for the reversionary interest of the R.I.B.A. under the Will of the late Mr. Walter Alexander Harvey [*F*].

Professor Basil Spence, O.B.E., A.R.A., A.R.S.A., the Hon. Secretary, moved the following Resolution:—

'That the Resolution in respect of the sale and assignment of the reversionary interest under the Will of Walter Alexander Harvey deceased duly carried at the Special General Meeting held on the 7th day of May 1957 be and is hereby confirmed.'

Mr. Martin S. Briggs [*F*] seconded the Resolution.

The Chairman then put the Resolution to the Meeting and it was carried, *nem. con.*

The Proceedings closed at 6.14 p.m.

Session 1956–1957. Minutes XIII. At the Eighth General Meeting of the Session 1956–1957 held on Tuesday 21 May 1957 at 6 p.m.

Mr. Harold Conolly, C.B.E., Vice-President, in the Chair.

The meeting was attended by about 400 members and guests.

The Minutes of the One Hundred and Nineteenth Annual General Meeting held on Tuesday 7 May 1957 were taken as read, confirmed and signed as correct.

The following members attending for the first time since their election were formally admitted by the Chairman:—*As Fellows:* Louis Erdi, William Glashan. *As Associates:* A. R. F. McGahan, R. S. Patharé.

Mr. John Summerson, C.B.E., B.A., F.B.A. [*A*], having read a Paper on 'The Case for a Theory of Modern Architecture', a discussion ensued and, on the motion of Dr. Jacob Bronowski, M.A., seconded by Mr. Michael Pattrick [*F*], a vote of thanks was passed to Mr. Summerson by acclamation and was briefly responded to.

The proceedings closed at 7.37 p.m.

British Architects' Conference, Oxford, 10–13 July 1957. A cordial invitation is extended to all members and Students of the R.I.B.A., the Architectural Association and the Allied Societies to attend the Conference to be held at Oxford from 10 to 13 July. Full details of the programme and the application form were enclosed with the March issue of the JOURNAL. Application forms should have been received by the Secretary R.I.B.A. by 21 June.

Members are again reminded that no hotel bookings can now be accepted by the R.I.B.A. and members must write direct to hotels they select. Reservations at Balliol College, St. John's College and Somerville College are still to be made through the Secretary R.I.B.A. Details are given in the Conference programme and also appeared in the January and February issues of the JOURNAL.

Forms of Agreement for Use between a Building Owner and an Architect. Members are reminded that, on the recommendation of the Practice Committee, the Council have approved the publication of Forms of Agreement in the four following editions:

(i) *Form of Agreement for General Use between a Private Building Owner and an Architect or Firm of Architects.*

(ii) *Form of Agreement for General Use between a Building Owner (being a Statutory Authority) and an Architect or a Firm of Architects;*

(iii) *Form of Agreement between a Local Authority and a Firm of Architects for Housing Work;*

(iv) *Form of Agreement between a Local Authority and a Firm of Architects for Multi-Storey Flats.*

In addition, on the recommendation of the Competitions Committee, the Council have approved a *Form of Agreement between the Promoters and a Firm of Architects appointed as the result of a Competition.*

The respective forms have been carefully designed to include all the essential points on which a clearly defined agreement between a building owner and an architect is needed, and to omit many irrelevant and repetitive clauses which, in the experience of the Institute, are so frequently inserted.

The five documents are now available in printed form, and may be obtained on application to the Secretary, R.I.B.A., 66 Portland Place, London, W.1 (price 6*d.* per copy, inclusive of purchase tax). Postage 3*d.*

Members and Professional Affixes. The Council's attention has been called more than once to the practice among some members of adding a string of letters of doubtful value to the affix indicating membership of the Royal Institute on their letter paper.

This is a matter in which the Council obviously cannot dictate to members, and must trust to their good sense. It should be obvious, however, that the affix of a chartered body of high standing is weakened in effect by the addition to it of a string of other mysterious designations some of which probably indicate no more than the payment of an annual subscription.

Correspondence with the Institute. In order to facilitate speedier attention to correspondence, and to relieve the staff of a great deal of research, it is particularly requested that members and Students will kindly state in all correspondence with the Institute the class of membership (*F, A, L* or *Student*) to which they belong.

Luncheon and Tea Facilities for Members. Members are reminded that there is a self-service dining room on the second floor of the R.I.B.A. building where luncheons are served between 12 noon and 2 p.m. on weekdays except Saturdays. The dining room is open to members and Students. There is a 'Club' licence and drinks can therefore be obtained with meals. Members may bring guests.

Morning coffee and afternoon teas have hitherto been served in the Members' Room on the first floor. Owing to the rebuilding programme the Members' Room has to be taken over for temporary office use and the service of coffee and teas will, during the period of rebuilding, be available on the second floor landing.

Shape and Sizes of Technical Literature. Postcards for use by members asking manufacturers to produce technical literature in accordance with B.S. 1311: 1955 are available from the Secretary, R.I.B.A., on application.

R.I.B.A. Distinction in Town Planning. The R.I.B.A. Distinction in Town Planning is by conferment only, and is limited to Fellows, Associates and Licentiates of the R.I.B.A.

The Distinction is the highest award in Town and Country Planning that the R.I.B.A. can bestow. It is solely intended for members of the R.I.B.A. who have made an outstanding contribution in the field of large-scale planning. Recommendations are submitted to the Council by a Standing Committee set up for the purpose.

Personal applications by candidates will not be entertained; the name of a candidate must be submitted by three sponsors, themselves members of the R.I.B.A., who will be required to submit the following particulars on behalf of the candidate:

(*a*) Details of professional qualifications and experience;

(*b*) Evidence of his work and experience, such evidence consisting of a list of the candidate's work, together with references to professional journals in which the works have been illustrated; and such other evidence as may assist the Committee in making their recommendation to the Council.

Nominations may be made twice a year on 1 March and 1 November, and should be addressed to the Secretary, Royal Institute of British Architects, 66 Portland Place, London, W.1.

Members upon whom the Distinction has been conferred will be entitled to use the designation 'R.I.B.A. Distinction in Town Planning', and it is advised that this should be used in full, or the initials 'R.I.B.A. Dist.T.P.' after the initials F.R.I.B.A., A.R.I.B.A. or L.R.I.B.A., according to the class of membership to which they belong.

Elections Void. Under the provisions of Bye-law 17 the elections of the following have been declared void: Reginald Keith Smart as Associate and Herbert Gordon Leigh as Licentiate.

ALLIED SOCIETIES

Changes of Officers and Addresses

Berks, Bucks and Oxon Architectural Association. President, Colin Cooper [*A*]. Hon. Secretary, D. F. A. Williamson, M.C. [*A*], 162 London Road, High Wycombe, Bucks. As from 1 August 1957.

Devon and Cornwall Society of Architects. President, A. Geoffrey Bazeley, M.B.E. [*F*].

Essex, Cambridge and Hertfordshire Society of Architects. President, Laurence J. Selby [*F*]. *Southend-on-Sea and District Chapter:* Hon. Secretary, L. E. Sansome [*A*], 18 Marcus Avenue, Thorpe Bay, Essex.

Gloucestershire Architectural Association. President, Arthur Saint [*A*]. Hon. Secretary, J. W. Foden [*A*], Ablington, Lansdown Road, Cheltenham, Glos. Secretary, D. R. B. Broom, 1 North Place, Cheltenham, Glos. As from 1 July 1957.

Leicestershire and Rutland Society of Architects. President, E. W. Parkinson [*L*].

Manchester Society of Architects. President, R. M. McNaught [*F*].

Northamptonshire, Bedfordshire and Huntingdonshire Association of Architects. President,

H. A. Rolls [*L*]. As from 1 July 1957. *Bedfordshire Branch.* Chairman, W. G. Walmsley [*F*]. As from 1 July 1957.

Northern Architectural Association, Tees-Side Branch. Hon. Secretary, Richard Brown, M.C., T.D., A.M.T.P.I. [*A*], 123 Victoria Road, Darlington.

Nottingham, Derby and Lincoln Society of Architects, Derbyshire Branch. Chairman, G. I. Larkin [*A*]. Hon. Secretary, J. K. Wareham [*A*], 77 Park Grove, Derby. As from 1 July 1957.

Wessex Federal Society of Architects. President, R. F. Fairhurst, A.M.T.P.I. [*A*]. As from 1 July 1957.

West Yorkshire Society of Architects. Hon. Joint Secretaries, D. M. Jones [*A*] and R. H. Winder [*F*], 11A Cavendish Road, Leeds. *Wakefield Branch.* Hon. Secretary, Alan Metcalfe [*A*], 4 The Crescent, Whitkirk, Leeds, 15.

York and East Yorkshire Architectural Society. President, Cecil Leckenby [*F*].

Edinburgh Architectural Association. President, James A. H. Mottram, A.M.T.P.I. [*A*].

Inverness Architectural Association. President, Lieut.-Colonel D. Polson Hall, T.D. [*F*].

Royal Incorporation of Architects in Scotland. President, Thomas W. Thoms [*F*].

Stirling Society of Architects. President, Robert Wilson [*A*].

South Wales Institute of Architects. President, Cyril A. Hughes [*L*]. As from 1 July 1957. *Central (Cardiff) Branch.* Chairman, F. G. Allen, A.M.T.P.I. [*A*]. As from 1 July 1957. *Western (Swansea) Branch.* Chairman, Howel Mendus [*L*]. As from 1 July 1957.

Alberta Association of Architects. President, H. L. Bouey, 310 Northern Hardware Building, Edmonton, Alberta, Canada.

Institute of Architects of Malaya. President, G. E. Magnay, A.M.T.P.I. [*A*]. Hon. Secretary, Kee Yeap [*A*], Public Works Department, High Street, Singapore, 6.

Institute of South African Architects. President-in-Chief, Colin M. Sinclair [*A*].

Saskatchewan Association of Architects. The semi-annual meeting of the Saskatchewan Association of Architects was held at the Hotel Saskatchewan, Regina, on Monday 13 May. The meeting commenced at 9.30 a.m. and was called to discuss revisions to the fee schedule for architectural services. The schedule was revised to bring it into line with schedules of the other provincial associations.

In addition general business matters were dealt with on the agenda. The meeting adjourned at 6.30 p.m.

COMPETITIONS

Development of the Leith Fort Housing Area. The Corporation of the City of Edinburgh invite architects practising or resident in Scotland to submit in open competition designs for the development of land at and adjoining Leith Fort, Edinburgh, for residential purposes.

Assessor: Professor J. L. Martin, M.A., Ph.D.(Manchester) [*F*].

Premiums: 750 gns., 500 gns., 350 gns.

Last date for submitting designs: 30 November 1957.

Last date for questions: 8 July 1957.

Conditions may be obtained from the Town Clerk, City Chambers, Edinburgh.

Deposit: 2 gns.

Notes from the Minutes of the Council

MEETING HELD ON 7 MAY 1957

Appointments. (*a*) *Council for the Preservation of Rural England: R.I.B.A. Representative.* G. A. Jellicoe [*F*] in place of the late Sir Patrick Abercrombie. (*b*) *International Federation for Housing and Town Planning: R.I.B.A. Representative.* Professor Robert H. Matthew [*F*] in place of the late Sir Patrick Abercrombie. (*c*) *West Suffolk County Council Award to Architecture: Assessor.* Professor J. Leslie Martin, Vice-President.

The Work of the Cost Research Committee. The memorandum (Paper D.834/57) was submitted to the Council and approval was given to its publication (May JOURNAL).

Membership. The following members were elected: as Honorary Corresponding Member 1; as Fellows 4; as Associates 10.

Students. 35 Probationers were elected as Students.

Applications for Election. Applications for election were approved as follows: *Election 18 June* 1957: as Fellows 13; as Associates 173. *Election 8 October* 1957 (*Overseas Candidates*): as Fellows 1; as Associates 11.

Application for Reinstatement. The following application was approved: as Associate: Larmont Douglas Penman.

Applications for Transfer to Retired Members' Class under Bye-law 15. The following applications were approved: as Retired Fellows: Frederick Robert Hiorns, Burnett Napier Henderson Orphoot.

Obituary. The Secretary reported with regret the death of the following members: Hubert James Hammick [*F*], Thomas Overbury, F.S.A. [*F*], Professor Adolf Rading [*F*], Henry Norman Edwards [*Retd. F*], David Harold Lewis [*A*], Han Cheng Lim [*A*], Louis Sydney Henshall, D.S.O. [*Retd. A*], Archibald Thomson Caldwell [*L*], John Merton Jones [*L*].

By resolution of the Council the sympathy and condolences of the Royal Institute have been conveyed to their relatives.

Civic Centre for the Borough of Enfield. Last day for submitting designs: 18 November 1957.

Full particulars were published in the JOURNAL for May, page 287.

Development of Berlin Centre. International Competition. Last day for submitting designs: 30 November 1957.

Full particulars were published in the JOURNAL for May, page 287.

COMPETITION RESULTS

Northern Ireland War Memorial

1. Mr. John Michael Bowley [*A*].
2. Mr. William F. Howard [*F*].
3. Mr. W. Granville Smyth [*A*].

Hon. Mentions: Messrs. Anderson Stewart, D.A. (Glas.), [*A*], and Alexander D. Bell [*A*]; Messrs. Munce [*A*] and Kennedy; Messrs. Derek S. Bottomley [*A*] and Anthony Le M. Pearce, Dipl.Arch (Nottm.) [*A*]; Messrs. Peter Silsby, Dipl.Arch. (Northern Polytechnic), [*A*], and Douglas H. Griffin; Mr. A. R. Osborne, Dipl.Arch.(U.C.L.), [*A*].

New Municipal Offices, Lusaka, Northern Rhodesia.

1. Messrs. Montgomerie and Oldfield [*AA*].
2. Messrs. Horace Williams [*F*] and Partners.
3. Mr. D. A. Stewart [*A*].
4. Messrs. John Taylor and K. W. Lane [*AA*].

New Technical College Buildings, Paisley, Scotland (see JOURNAL for May, page 287). Specially mentioned: Mr. G. M. G. Dorward [*A*]; Mr. Ian Burke [*A*]; Architects' Co-Partnership [*AA*]; Messrs. Hammett and Norton [*FF*]; Messrs. D. H. Lanham [*A*] and E. H. Barker.

GENERAL NOTES

The Social Aspects of Housing. A Seminar, 'The Social Aspects of Housing', is being held in French at Sèvres near Paris from 6 to 16 October 1957, under the auspices of the United Nations Technical Assistance Administration. It is part of the European Social Welfare Programme. Discussions will take place on various social questions related to housing and town planning.

The Seminar is open to highly qualified candidates, senior government and local authority officials, sociologists, town planners and architects. There are three to four vacancies for people from the United Kingdom.

Application forms can be obtained from the Secretary of the British Committee for the Interchange of Social Workers and Administrators, 26 Bedford Square, London, W.C.1.

R.I.B.A. Cricket Club. The annual cricket match between the R.I.B.A. and the L.M.B.A. was played at Wanstead on Wednesday 22 May, and resulted in a win for the R.I.B.A. by four wickets.

The game was watched by Mr. K. C. F. Foster (Immediate Past-President of the L.M.B.A.), Mrs. Foster and other members of the L.M.B.A. Council, and Mr. Peter Adams, President of the R.I.B.A. Cricket Club.

The L.M.B.A. batted first and scored 138 runs—S. Wright, 51; I. Thomas, 23; J. J. Webb, 39. C. A. R. Norton took 3 wickets for 27; J. G. Batty 3 for 46, and D. L. Robinson 3 for 47.

The R.I.B.A. made 140 for 6 in reply. J. G. Batty scored 23, A. Chegwidden, 24; A. Marlow, 23; and G. G. Banfield, 40. For the L.M.B.A., A. Cload took 2 wickets for 38, and I. Thomas 3 for 23.

Obituaries

Willie Josiah Freeman [*Retd. A*] died on 24 March 1957, aged 75.

Mr. Freeman was articled to Messrs. Jackson and Fox of Halifax. In 1906 he left his native Yorkshire to join Mr. W. Roland Howell [*F*] of Reading, as Managing Assistant, continuing as such until the death of Mr. Howell in 1940. He then took over the practice in partnership with Mr. G. Batten [*L*], later being joined by Mr. E. W. May [*L*] under the title Howell, Freeman and Batten. Ill health forced his retirement in December last year. The practice is being continued by his partners.

During his long association with the late Mr. Howell, and as a partner of Messrs. Howell, Freeman and Batten, Mr. Freeman was responsible for the design and erection of many public and private buildings in Reading and district, including St. Laurence's Hall, Vincent's motor showroom in Station Square, and Burberry's in Mill Lane, Reading.

During the 1914–18 War Mr. Freeman served in France with the Royal Engineers and attained the rank of Captain.

He was a founder member and later Chairman of the Berkshire Society of Architects. Later he was closely associated with the formation of the Berks, Bucks and Oxon Architectural Association of which he became Honorary Secretary. Mr. Freeman also took a keen interest in the work of the Architects' Benevolent Society and was active as their local representative.

Vivian Palmer Haughton [*A*] died on 17 September 1956, aged 65.

Mr. Haughton was born in Wellington, New Zealand, and after studying at Island Bay School and Wellington Technical College, he joined the firm of Crichton and McKay in 1907 as a pupil. There he remained throughout the 49 years of his professional career, becoming a partner in 1925, when it became Crichton, McKay and Haughton, and later senior partner. The firm is known today as Haughton, Son and Mair.

Among the larger works carried out by the partnerships were the new Administrative Block, Nurses' Home, Laundry and ancillary buildings for Wellington Hospital; Hawera Hospital; Hutt Valley Hospital; the Maternity Hospital, Wanganui; the 'Dominion' Building; the Huddart-Parker Building; the Levy Building; and many large branch banks throughout the country, including the Bank of New Zealand, Newtown.

Mr. Haughton had had a lengthy military service. Starting with the Wellington Naval Volunteers, he was commissioned in 1914. He then joined the Field Artillery, serving at Gallipoli and in France, where he was severely wounded in the head at the Battle of the Somme in 1916. He was sent back to New Zealand in 1917 after recovery, where he resumed work with Crichton and McKay. However, he remained in the Artillery, reaching the rank of Major, and was finally posted to the retired list in 1948.

Mr. Haughton served on the New Zealand Institute of Architects Committee of Architectural Education in its earlier days before it was located in Auckland, and for many years on the Branch Committee and on the Council of the Institute, and he was Chairman of the Wellington District Branch in 1948 and 1949. In more recent years he was appointed as the Institute representative on the Master Builders' Registration Board. He was elected an Associate of the New Zealand Institute in 1913 and advanced to Fellowship in 1939; and he was elected an Associate of the R.I.B.A. after passing the R.I.B.A. Special War Examination in 1923.

He was active in many other spheres including boating, golf, the Y.M.C.A., and local government.

Mr. Haughton's son, Mr. R. B. Haughton, has carried on his father's practice with Mr. J. Lindsay Mair.

Frederick William Pamplin [*L*] died on 4 September 1956, aged 70.

Mr. Pamplin received his training in the office of Mr. W. Egerton [*L*], Erith, becoming his assistant in 1900. He was architect to Messrs. Price's Patent Candle Co., Battersea, from 1915 until he began private practice in Abbey Wood in 1924. From 1931 to 1952 he was Assistant Architect to Erith Borough Council, but in 1952 he resumed private practice, and continued in it until his death.

His principal works include the Offices and Factory of Abwood Tool Co., Dartford, and the Radio Factory for Burndept-Vidor, Erith.

His son, Mr. D. J. Pamplin [*A*], now carries on the practice.

Rupert Savage [Retd. *F*] died on 2 November 1956, aged 85.

Mr. Savage was educated privately and at Queen's College, Dublin. After training in London, he went to Birmingham, where for a short period he was in the office of Mr. J. P. Osborne[*F*]. He transferred to Messrs. J. Crouch [*F*] and E. Butler [*F*], with whom he later entered into partnership. His partner, Mr. W. Cyril Moss [*L*], who is continuing the practice, writes:

'Hitherto this practice had consisted largely of domestic work with a mixture of industrial and commercial building. To this, Mr. Savage brought a remarkable run of successes in architectural competitions. Among these were the Training Colleges at Hull and Dudley and the Technical School at Sutton Coldfield, together with a number of Free Libraries and Schools. Selected to take part in the final competition for the Methodist Central Hall at Westminster, his design was placed second, as was also his design for Southampton Town Hall. His winning design for Manchester Art Gallery and Free Library attracted considerable attention for the freshness of his classical treatment, also exemplified in his façade of the Masonic Memorial Temple in Broad Street.'

Housing schemes at Warwick, Leamington Spa, Coventry and West Bromwich occupied his attention in the inter-war years, together with local works carried out in Methodist Churches at Four Oaks, Hall Green and Warley Woods. Other works included Public Transport bus depots for the City of Birmingham; schools at Birmingham and Sutton Coldfield; Head Offices for the South Staffs Waterworks Co.; and York House in Great Charles Street, Birmingham.

Mr. Savage was a past President of the Birmingham and Five Counties Architectural Association and had represented that body on the R.I.B.A. Council and the Allied Societies' Conference.

Alfred Ewart Smith [*A*] died on 24 November 1956, aged 59.

Mr. Smith was born in Leicester, the son of Alfred Ernest Smith, a Freeman of the City. He was educated at Wyggeston Grammar School and attended there until 1914, when he joined the late A. H. Hind [*F*] as junior assistant.

After joining the R.A.M.C. in 1915, he served with the 49th Midland Division in France, where he was wounded three times. He was later transferred to the Royal Engineers Ordnance Survey Department, G.H.Q., as a cartographic draughtsman.

On returning to civilian life in 1919, he resumed his studies and was articled to the firm of Pick, Everard, Keay and Gimson of Leicester, where he remained until 1939, when he became Assistant Surveyor with the Malden Borough Council, Surrey. He later joined the staff of the Ministry of Works, London, where he remained until his death.

Mr. Smith was fond of music. He himself played the piano and wrote lyrics which gave a great deal of pleasure to his intimate associates and friends.

Members' Column

This column is reserved for notices of changes o address, partnerships vacant or wanted, practices for sale or wanted, office accommodation, and personal notices other than of posts wanted as salaried assistants for which the Institute's Employment Register is maintained.

APPOINTMENTS

Mr. George Englesmith [*A*] has been appointed Visiting Critic at the University of Houston School of Architecture. He has re-settled in Houston, Texas, as associated architect with Messrs. Hedrick, Stanley & Lightfoot, and has been made a member of the Architectural Advisory Committee of the University of Houston. His new address is 4816 Bellaire Boulevard, Bellaire, Texas, U.S.A.

PRACTICES AND PARTNERSHIPS

Mr. John David Anderton [*A*] has been taken into partnership by **Messrs. Foster-Smith and Wallis** [*AA*] of Prince's Chambers, 37 Hall Gate, Doncaster. The title of the firm will remain unchanged.

The title of the firm **Brunton, Baden Hellard and Partners** has been changed to **Brunton, Baden Hellard and Boobyer—Mr. E. Hunwick Boobyer** [*A*] having been a partner for the last three years.

Mr. C. F. Cawsey, A.N.Z.I.A. [*A*] has commenced private practice with **Mr. C. Newton Hood.** The title of the firm is **C. Newton Hood and C. F. H. Cawsey** and will be carried on at HB Building, Ridgway Street, P.O. Box 51, Wanganui, New Zealand.

Following the retirement last year of **Mr. H. Munro Cautley** [*A*], the name of the firm of **Cautley and Barefoot** of Ipswich, has been changed to **Leslie and Peter Barefoot.** The partners, **Mr. Leslie Barefoot** [*A*] and **Mr. Peter Barefoot** [*A*], will continue the practice at 22 Thorofare, Ipswich.

Mr. T. V. Deas [*A*] has taken into partnership **Mr. Henry Taylor** [*A*]. The firm will continue to practise under the title **Joshua Clayton and Deas** at High Row Chambers, Darlington, Co. Durham.

The practice of the late Mr. Joseph Emberton [*F*], of 17 Chantry House, Eccleston Street, Buckingham Palace Road, London, S.W.1, will be continued by **Dr. C. L. Franck** [*A*] and **Mr. H. M. Tardrew** [*A*] at the same address, under the title of **Emberton, Franck and Tardrew.**

Mr. H. Richard Hughes [*A*] has begun private practice at 54 Marlborough Road, P.O. Box 486, Nairobi, Kenya, East Africa (Nairobi 60622), where he will be pleased to receive trade catalogues, etc.

Mr. John Mather [*A*] has commenced practice at 84 Bridge Street, Warrington, Lancs. (Warrington 35196).

On the retirement of **Mr. W. A. Gordon Mitchell, Mr. C. B. Williams** [*L*] will continue to practise at 3 St. Andrew Street, Plymouth, under the style of **Gordon Mitchell and Williams.**

Mr. Clement C. Ogden [*F*] has retired from active practice and **Mr. Arthur Dodd** [*L*] will continue to practise under the same style of **Clement C. Ogden and Arthur Dodd** at 18 Millstone Lane, Leicester (Leicester 58630).

Mr. D. Perry Short [*A*], formerly of Rudolf Papanek & Associates, Timmins, Ontario, Canada, has now begun private practice in Elliot Lake, Ontario, Canada.

The partnership of **Westwood, Sons and Harrison** was dissolved by mutual consent on 13 April 1957. Two new partnerships have been formed. **Mr. Bryan Westwood** [*F*] and **Mr. Norman Westwood** [*F*], with **Mr. Gilbert Chapman** [*A*] and **Mr. Noel Brandon-Jones** [*A*] as associate partners, have formed the partnership of **Westwood, Sons and Partners** and are practising from 21 Suffolk Street, London, S.W.1 (TRAfalgar 4411). **Mr. J. E. K. Harrison** [*F*] and **Mr. A. A. Macfarlane** [*A*] have formed a partnership with **Mr. Robert Potter** [*F*] and **Mr. Richard Hare** [*A*] under the title **J. E. K. Harrison, Potter, Hare and Macfarlane** and are retaining the former offices of Westwood, Sons & Harrison at 19 Broadstone Place, Baker Street, London, W.1 (WELbeck 0694). The existing practice of **Messrs. Potter and Hare** will continue to be run from De Vaux House, Salisbury, Wilts.

CHANGES OF ADDRESS

Mr. Alfred Baker [*A*] has changed his address to Cobhambury House, Cobham, Kent (Cobham 388).

Messrs. Grenfell Baines and Hargreaves have opened a new office at Martins Bank Chambers, Market Square, Derby (Derby 46063). **Mr. Peter T. Renninson** [*A*] has become an Associate in the firm and will be in charge of the new office, where he will be pleased to receive trade catalogues, etc. Sales representatives can be seen by appointment only. This office is in addition to those already at 12–24 Guildhall Street, Preston; 58 Topping Street, Blackpool; 423 Oxford Road, Manchester; and 123 Victoria Road, Darlington.

Messrs. Frederick Barber and Partners have opened an office at 184 High Street, Guildford, Surrey, and **Mr. K. Douglas Bundy** [*A*] will be in charge.

Mr. C. Duncan Biggin [*A*] has changed his address to 32 Lynton Drive, Shipley, Yorks.

Mr. H. H. Carr [*A*] has changed his address to 85 Oxford Avenue, Gorleston, Great Yarmouth.

Mrs. Barbara Dent [*A*] has moved her office to Sandhills Corner, Wormley, Godalming, where she will be pleased to receive technical and trade literature.

Mr. Harold Doffman [*A*] and **Mr. Peter T. Leach** [*A*] of Doffman & Leach have moved their office to 17 Wolverhampton Road, Stafford (Stafford 406).

Messrs. Peter Dunham, Widdup and Harrison have opened a branch office at 14–15 Stephyns Chambers, Bank Court, Hemel Hempstead, Herts (Boxmoor 5934), where they will be pleased to receive trade catalogues, etc.

The new address of **Mr. John K. Gregson** [*A*] is F.P.W.D. (H.Q.), Lagos, Nigeria.

Mr. D. Gardiner Hardie [*A*] has changed his office address to 17 Great Stuart Street, Edinburgh, 3.

Mr. Philip Hicks [*A*] is now practising from 11 Duke Street, Manchester Square, London, W.1 (WELbeck 6343).

Mr. Frederick R. Hiorns, F.S.A. [*Retd. F*], expects to leave 3 Eton Villas, London, N.W.3, in the near future and does not wish to receive any further trade catalogues, etc.

Mr. J. T. Hirst [*A*] has changed his address to c/o The City Architect and Building Surveyor, City Hall, Singapore, 6.

Messrs. Johnston and Baxter have moved to new offices at 20 South Tay Street, Dundee.

Mr. Ervin Katona [*A*] of 23 Old Burlington Street, London, W.1, has changed his telephone number to REGent 1945–6.

Mr. B. C. King [*A*] has changed his address to 40 Mount Grace Road, Potters Bar, Middx. (Potters Bar 6726).

Mr. Owen Luder [*A*] has opened new offices at 79 Regency Street, Westminster, London, S.W.1 (TATe Gallery 5250).

Mr. John Pantlin [*A*] has moved his office to 14 East Street, Wimborne, Dorset (Wimborne 974).

Mr. Peter Edward Sharp [*A*] has changed his address to 10 Clarence Avenue, New Malden, Surrey.

Mr. E. A. Straker [*A*] has changed his address to 107 Grange Crescent, Hykeham Road, Lincoln.

Mr. J. K. Thompson [*A*] has changed his address to 24 Mernda Avenue, Carrum, Melbourne, Victoria, Australia.

As from 1 July the address of **Mr. Cecil F. Wright** [*A*] will be c/o City Architect and Director of Housing, Blackburn Chambers, Dale Street, Liverpool, 2.

PRACTICES AND PARTNERSHIPS WANTED AND AVAILABLE

Associate (37), at present associate partner without prospects or security, seeks an appointment leading to a partnership where hard work and capability are valued. Varied experience, many connections, good administrator. Some capital available. Go anywhere within reason. Box 34, c/o Secretary, R.I.B.A.

Partnership available, to develop expanding practice in north-west provincial city. Capital required. Interview in London. Substantial contracts in hand. Box 42, c/o Secretary, R.I.B.A.

A firm of architects with several busy offices wishes to contact a member with a practice in London, capable of expansion, with a view to forming an association. Box 45, c/o Secretary, R.I.B.A.

Fellow (A.M.T.P.I., F.I.L.A.), with established practice in West Midlands town, and rooms in nearby city, wishing to develop wider opportunities, desires partnership or exchange of practices with London architect. Willing to take over gradually if required. Box 46, c/o Secretary, R.I.B.A.

Associate taking over country practice has for disposal present practice in London, W.C. area, with fully equipped offices; nominal sum accepted for the lease, furniture and goodwill. Box 47, c/o Secretary, R.I.B.A.

Highly qualified architect (Associate) with experience in both public and private work seeks partnership or post in London with a view to partnership. Small amount of capital available but would prefer to work off capital from salary. Box 48, c/o Secretary, R.I.B.A.

Architect with reasonably-sized practice in Hertfordshire wishes to amalgamate with an architectural practice in London. Box 49, c/o Secretary, R.I.B.A.

WANTED AND FOR SALE

Professor R. A. Jensen [*F*], Department of Architecture, University of Adelaide, South Australia, is anxious to receive the widest possible selection of catalogues, brochures, prices and other detailed or general information relating to every type of building materi and equipment. It would also be most helpf in cases where these materials or equipment a already available in Australia if details of th agencies could also be included.

Fellow has for disposal some pine drawi boards and mahogany T-squares and oth drawing equipment. Box 43, c/o Secretary R.I.B.A.

ACCOMMODATION

Fellow with offices in Bromley, Kent, ha accommodation available consisting of co room and part use of drawing office. Suitab for young architect with small practice or ou just starting in practice. Secretarial servic could be arranged. Box 41, c/o Secretary R.I.B.A.

To let, in Mayfair, London. Drawing offic 230 sq. ft., and smaller office, 130 sq. ft. Fur nished or unfurnished. Box 44, c/o Secretary R.I.B.A.

Architect with well-appointed office spac comprising 800 sq. ft. in Gray's Inn, London W.C.1, desires to share accommodation wit another. Secretary available. Box 50, c/o Secretary, R.I.B.A.

MISCELLANEOUS

Opportunity occurs for member to arrang exchange for three weeks between son o daughter and 17½-year-old son of Germa architect in Nuremburg. Two other children son aged 14 and daughter 12, would provid companionship for English boy or girl o younger. The German boy would wish to com to England, 11 August to 1 September. Box 4 c/o Secretary, R.I.B.A.

The Royal Institute of British Architects, as a body, are not responsible for statements made or opinions expressed in the JOURNAL.